

# The Mining Journal

LONDON, APRIL 11, 1958

Vol. 250. No. 6399.

Price Ninepence

## MINING EQUIPMENT

For Dependability  
and service

Designed to suit the most  
arduous working conditions

Progressive scientific research blended with "On the Site" experience ensures best quality products from the finest materials. Hadfields range of Crushers and Earth Moving Equipment reflect results and experience collated over 50 years past association with the Mining Industry.

**HADFIELDS**  
SHEFFIELD

HADFIELDS LTD. EAST HECLA WORKS, SHEFFIELD, ENGLAND

**conveyed  
safely**



To convey safely *care* has to be taken; and with conveyor belting the right point at which *care* should be taken is at the design, development and manufacturing stages. After that it should take *care* of itself, the people who work with it and the load it carries. The unique research and manufacturing facilities of Rubber Improvement Ltd. make certain that Leonex P.V.C. Multiply Conveyor Belting is produced with such *great care* that long life, dependability and safety are ensured.

LEONEX "Green for Safety" P.V.C. Conveyor Belting, standard quality (32 oz. duck) and super impact resistant quality (42 oz. duck).

RILON "Green for Safety" flexible and high tensile belting, incorporating high tenacity rayon.

**LEONEX**  
*Green for safety*

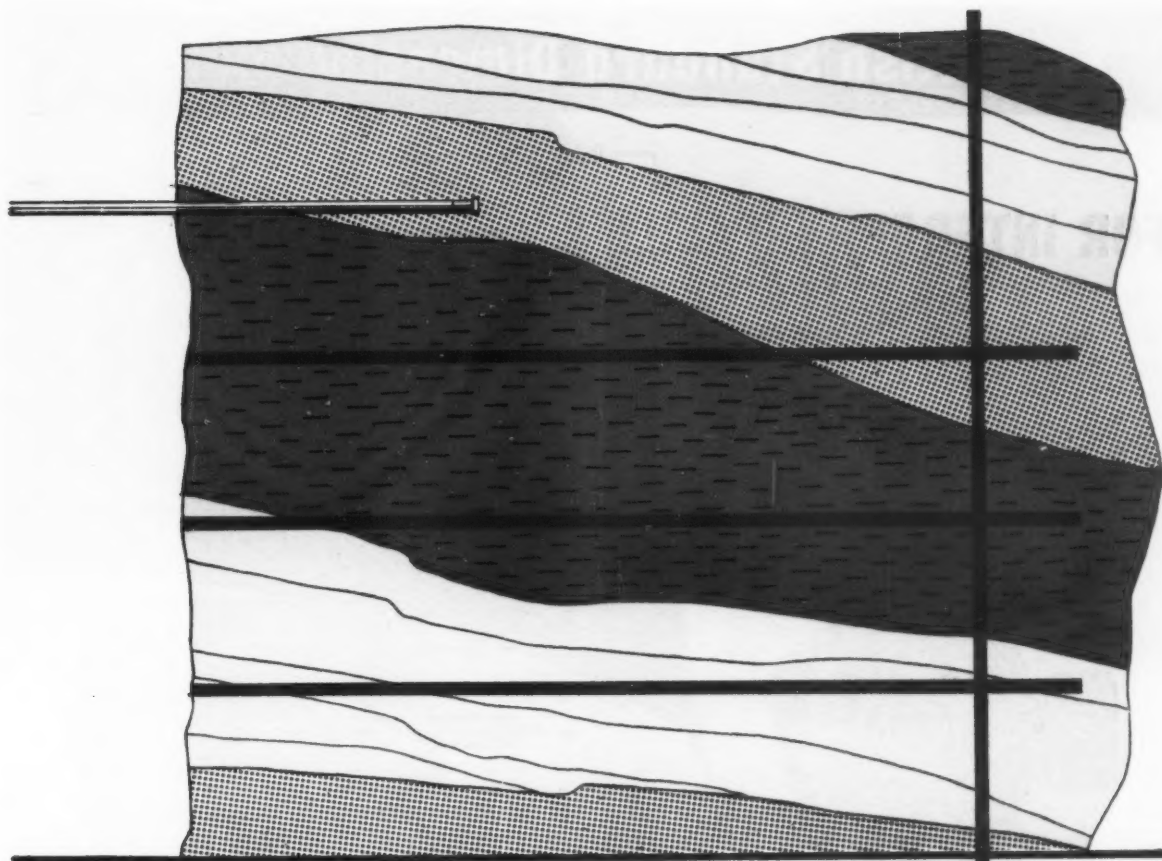
P.V.C. MULTIPLY ANTI-STATIC FIRE-RESISTANT

**CONVEYOR BELTING**



**RUBBER IMPROVEMENT LIMITED**

Rilex Works • Wellingborough • Northants • Tel: Wellingborough 2218



## **Drill parallel holes at sustained high speed —with the improved Holbit**

You'll cut drilling time and improve blasting efficiency with the Holbit. Made only by Holman—in a factory laid out especially for the purpose—the Holbit is tungsten-carbide tipped and designed to drill straight, even-diameter holes at a fast, constant rate. Fewer drill rods and fewer steel changes are needed. And the amount of compressed air used by smaller steel drills is greatly reduced.

Single chisel and cross types are made in many sizes and in grades of carbide to suit every sort of rock. They can be used with any type, size and make of drill.

Holbits can save you a mint of money. Fast drilling, fewer steel changes, less transport, less compressed air. And improved blasting.

What are you waiting for?



**Holman**  
PNEUMATIC EQUIPMENT

**pays . . . with its life**

**HOLMAN BROS. LTD., CAMBORNE, ENGLAND**

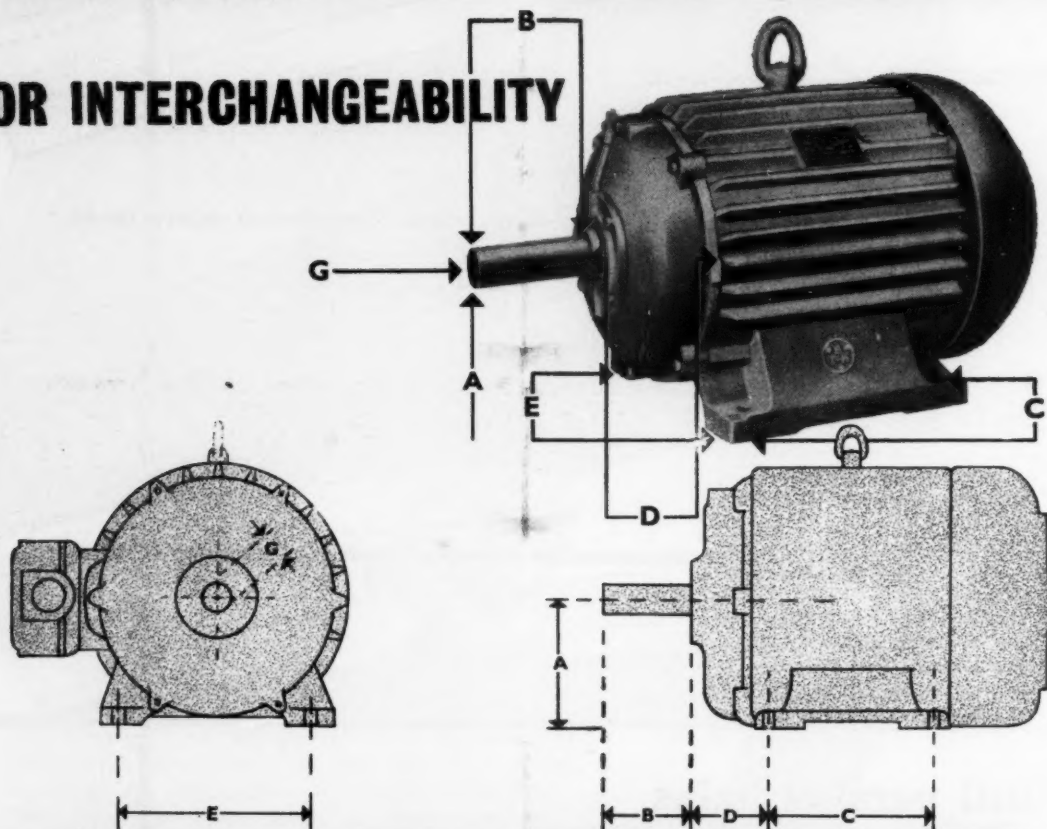
*The Holman Organisation is world-wide. It includes the Climax Rock Drill & Engineering Works Ltd., and has agents, branches and technical representatives throughout the United Kingdom and in 84 other countries.*

*Telephone: Camborne 2275 (10 lines). Telegrams: Airdrill, Telex, Camborne. London Office: 44 Brook Street, W.1. Telephone: Hyde Park 9444*

HJ22

## Fit British Standard Dimension Motors

### FOR INTERCHANGEABILITY



### Specify BTH FOR DEPENDABILITY

Continuity of production and the fullest possible use of plant—these are the benefits brought by interchangeability, as every maintenance engineer knows. BTH Motors were among the first British Standard Dimension machines produced and are unsurpassed for electrical performance and dependability. They are totally-enclosed, fan-cooled, squirrel-cage machines, manufactured to B.S. 2083 in a range of up to 50 h.p.

**BTH Advisory Service for Industry**  
BTH specialist engineers are at your service, ready to use their experience and knowledge to help you solve any problems on electrical equipment. Please make use of our Advisory Service freely at any time.

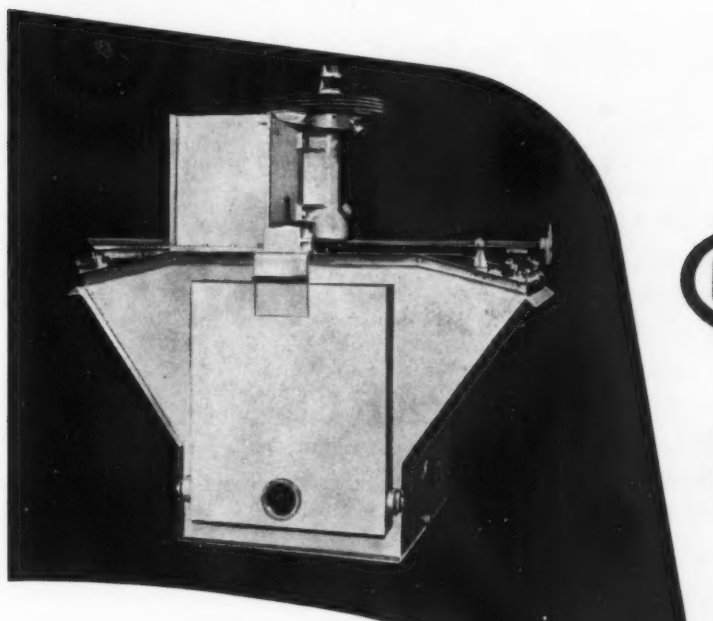


**BRITISH THOMSON-HOUSTON**

THE BRITISH THOMSON-HOUSTON COMPANY LIMITED • RUGBY • ENGLAND

Member of the AEI group of companies

A5055



Birtley flotation equipment in conjunction with the complete recovery of the cleaned fine coal in dry friable form and adequate tailings thickening and disposal plant ensures clean wash water and closed circuit conditions.



## K & B Froth Flotation Cells

Incorporated in Coal Preparation Plants ensure a controlled ash content of cleaned fine coal with high recovery efficiency.

*Two banks of flotation cells recently installed in the Birtley Coal Preparation Plant at Ollerton Colliery fulfilling the above conditions. This washery incorporating Baum boxes is dealing with 350-ton: per hour of 6"—0 raw coal.*

### BIRTLEY ENGINEERING LIMITED

MEMBER OF THE B.S.A. GROUP

COAL PREPARATION DEPT: WEST BARS CHESTERFIELD • TEL: CHESTERFIELD 4116 (2 lines)

Registered Office: Birtley • Co. Durham • Tel: Birtley 248 & 249

London Office: Claridge House • Davies Street • London W1 • Tel: Mayfair 4157

P228

EVERYONE WORRIES ABOUT SPARES at some time or other. The older the machine the greater the worry, for few manufacturers hold large stocks of parts for obsolete machines.

Proud possessors of very old Sullivan machines are often asking us for help. It may take a little longer to fulfil this kind of request, but it's good to know that our Spares people go to great lengths to put the old machine back on the job.

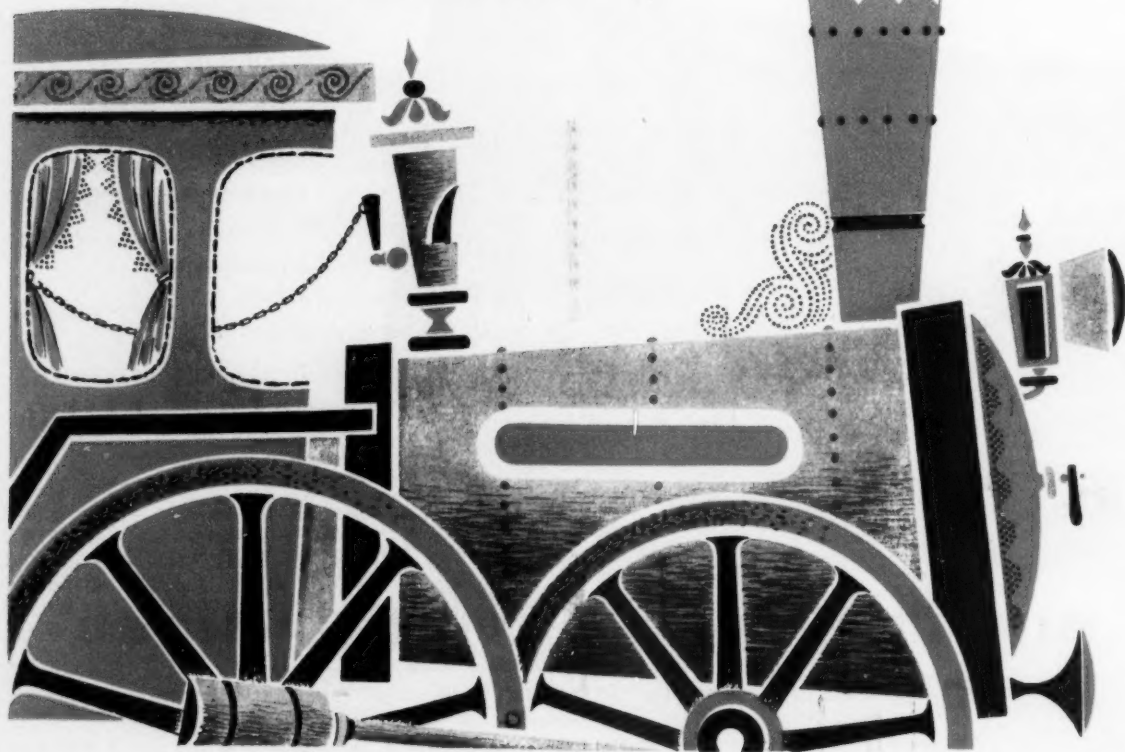
With vintage models or current production, Joy place great importance on good spares service

## WORRIED ABOUT SPARES ?

JOY • SULLIVAN

SPARES SERVICE

JOY-SULLIVAN LTD. Cappielow • Greenock • Scotland  
Spares Division: Callywhite Lane, Dronfield, Nr. Sheffield.  
Export Sales: 7 Harley Street, London, W.1.



***Greater loads . . higher lifts . . longer flights with***

**GOOD  YEAR**

## **RAYON CONVEYOR BELTS**

A full range of rayon-carcass conveyor belts is available from Goodyear for applications where higher tension ratings are desirable. The special advantages of Rayon belts make possible a fresh approach to new installations, and also help to eliminate many difficulties with existing installations.

Manufactured in three different weights of rayon and to a wide variety of cover specifications, we are able to supply the most economical belt for any type of service. With knowledge of your operating conditions we will gladly advise on the Goodyear rayon carcass belt best suited to them.

### **Greater Efficiency**

Higher tensions, with ample safety factor and less stretch, permit greater loads, longer flights and higher lifts. This means simpler layout, fewer transfer points and easier sequence control.

### **Better Troughing**

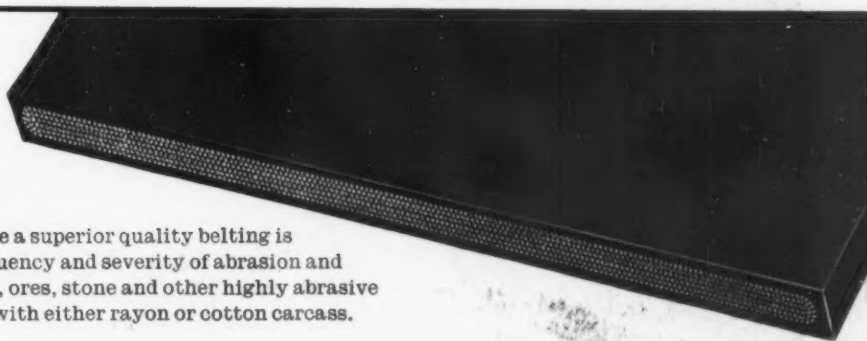
The thinner construction ensures better troughing and less dead weight on highly-rated belts. The higher grades of rayon belting have ratings away above anything that is practical in cotton construction, and yet trough perfectly.

### **Longer Belt Life**

Extra flexibility means that belts can wrap driving rollers and snub idlers more closely, yet retain the excellent impact resistance needed for loading points. Belts therefore last longer.

### **STACKER**

Designed for use where a superior quality belting is demanded by the frequency and severity of abrasion and flexing. Ideal for coke, ores, stone and other highly abrasive materials. Available with either rayon or cotton carcass.



**GOOD  YEAR**

**INDUSTRIAL RUBBER PRODUCTS**

**CONVEYOR BELTING • HOSE • V-BELTS • TRANSMISSION BELTING • FENDERS**

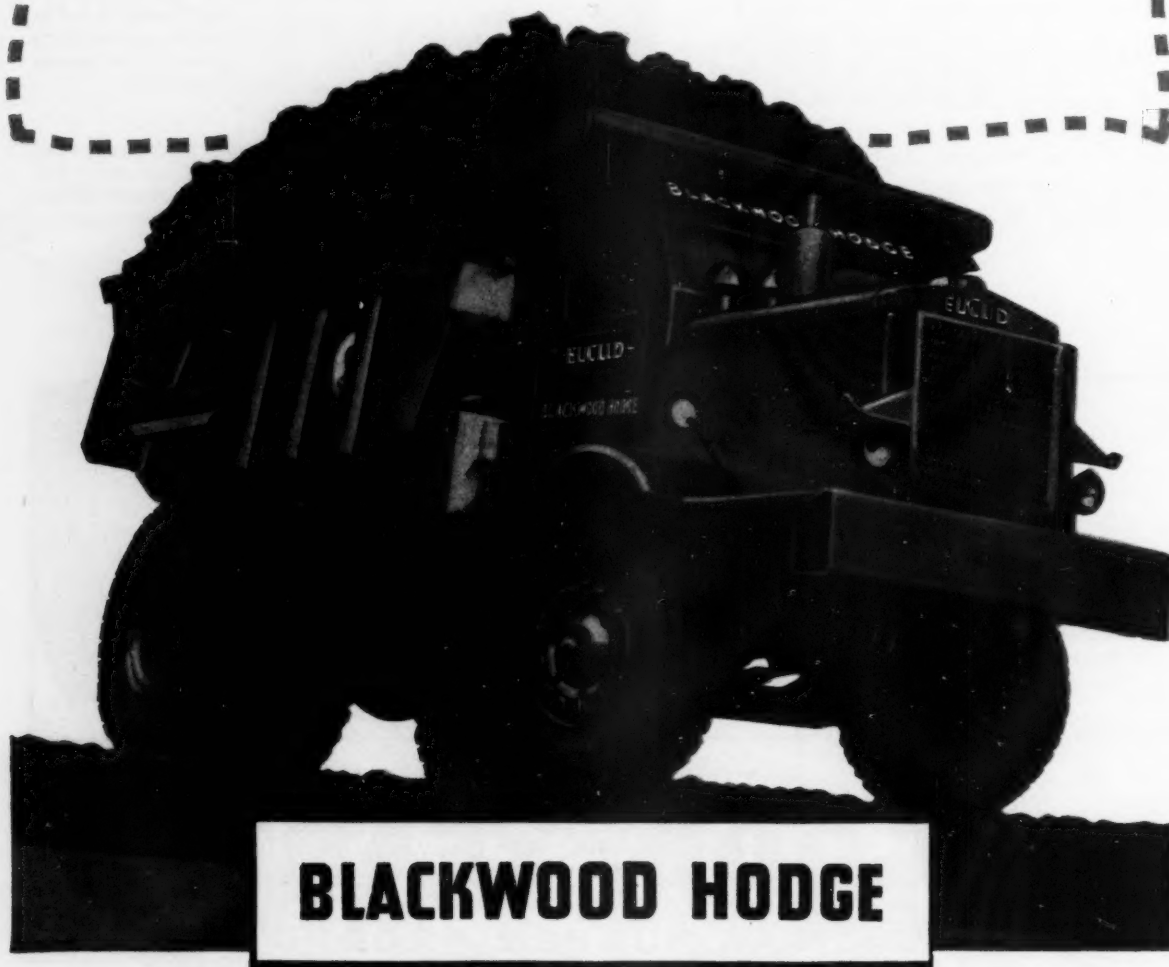
## **EUCLIDS halve the cost of dumping Pit Waste**

At many British pits, EUCLIDS are hauling more and bigger loads, in *less* time, at *less* cost.

At one Yorkshire Colliery, for instance, EUCLID 22-tonners are consistently reducing the cost of dumping pit waste *by as much as 50%*.

In *one* shift, one EUCLID alone moved 1,000 tons of waste.

EUCLIDS, world-famed for BIG performance in tough conditions, are available for sterling. Ask for further details or better still, a demonstration.



# **BLACKWOOD HODGE**

*Subsidiary Companies Branches Works and Agencies throughout the World*

# The Mining Journal

London, April 11, 1958

## In this issue . . .

Facts are the Best Market Stabilizer . . .	407
Revised Legislation for Northern Rhodesian Mining . . .	408
Australia's Search for Tin Ore . . .	408
The Mineral Deposits of Cuba . . .	409
The Convertol Process . . .	411
Concrete Headgear by Continuous Pouring . . .	411
Sintered Metal in Earthmoving Equipment . . .	411
Testing the Multi-Rope Winding System . . .	412
Machinery and Equipment . . .	414
Mining Miscellany . . .	416
Metals and Minerals . . .	418
London Metal and Ore Prices . . .	419
Mining Finance . . .	420
Company Meetings . . .	422
Publications Received . . .	423
Rand and Orange Free State Returns for March . . .	424

Vol. 250

No. 6399

Established 1835

### Joint Editors

U. Baliol Scott R. Bruce Dunfield

### News Editor

A. G. Thomson

### Assistant Editor

R. Bowran

### Display Advertisement Manager

E. S. Hooper

### Circulation

Robert Budd

Published each Friday by

THE MINING JOURNAL LTD.

### Directors

E. Baliol Scott  
(Chairman)

U. Baliol Scott  
(Managing)

G. A. Baliol Scott

R. A. Ellefsen

15, WILSON STREET,  
LONDON, E.C.2

### Telegraphic

Tutwork London

### Telephone

MONarch 2567 (3 lines)

Annual Subscription £3

Single copy ninepence

## Facts are the Best Market Stabilizer

IN the context of the present low level of metal prices and the consequent *ad hoc* cutbacks in production, it is interesting to observe some current efforts at stabilization in certain other commodities. Thus the F.A.O.'s working party on cocoa has been meeting in London to examine the possibility of a price stabilization scheme (probably of the buffer stock type) for a commodity which since 1953 has fluctuated between 150s. and well over 600s. per cwt. Whether a draft agreement will eventuate is, however, doubtful.

In another direction, the International Rubber Study Group has a meeting planned for the summer and we have already had one or two speeches from the United States which have hinted at the opposition that will be forthcoming from this principal consumer if, as is expected, a fresh attempt is made by the Group to produce a stabilization agreement.

There is a remarkable contrast with all this in the attitude of copper, lead and zinc producers to their present plight. However gloomy the prospect has appeared for the big copper producers, not one of them has suggested that an international stabilization group could provide a way out of their difficulties; and the high degree of vertical integration in the industry was one of the reasons why one heard no calls for an agreement from consumers when copper was well in excess of £400 per ton. The producers instead have directed their attention to the cutting back of output but they have been careful to avoid formal negotiations which could be interpreted as any kind of output restriction agreement.

Similarly, the American lead and zinc producers have had a hard year but they appear much more ready to face the bankruptcy and ruin, which they frequently predict for themselves, than to stomach international price agreements for these metals.

We may, indeed, be witnessing the end of an era. When the war ended there were long and detailed discussions on how to produce stable trading conditions for minerals and other raw materials. With the experience of the 1930's in mind, it was thought that unless trade in commodities could be stabilized, there could be no hope of maintaining full employment and a high level of general international trade. It was therefore decided within the United Nations that, in future, producers should not be allowed to control commodity agreements. Instead, it was felt agreements should be arranged by governments rather than by commercial interests, should be representative both of producer and consumer countries, and should be drawn up and operated with the minimum secrecy.

There is no denying that the hopes of the world in 1945 in this respect, have not been fulfilled. Two or three rather fragile commodity agreements are all that have come out of these high hopes. More important still, there is a widespread lack of enthusiasm for the drawing up of further agreements. Not only does the U.S. Government appear to be instinctively opposed to commodity agreements for anything of which the States is a substantial im-

porter (and that means most things), but the governments of producer countries are often hard put to it to achieve a united front amongst their own producers.

These in themselves are reasons enough for the failure over these past ten years to launch more international commodity agreements. There is, however, a further obstacle to the conclusion of such agreements—or, for that matter, to the smooth working of markets which rely on the unfettered operation of the price mechanism. This is to be found in the singularly inadequate state of international commodity statistics, even in such elementary matters as production, consumption and stock figures.

Thus, more than three months after the end of the year, complete country-by-country mine output figures for 1957 are not yet available either for copper, lead or zinc, and we know of no source which at any time publishes accurate world-stock figures for these metals. The statistics for tin are (and for long have been) a model for other metals, yet even here some observers feel that the difficulties, with which the International Tin Council has had to cope, may in part have been due to a substantial underestimation of the true stockholdings of American tin users. If this sort of doubt can arise in a well-informed industry, what are the chances of success in working an agreement where the statistics are nothing like as good?

Whether a commodity market is to be allowed to operate freely or under control, an accurate statistical equipment is the first prerequisite to the elimination of sudden fluctuations in price in the former case or severe strain on the buffer stock in the latter case. We had occasion to refer to this requirement in our leading note last week in the context of formulating a Commonwealth mineral resources policy, and this is merely a further aspect of the same problem.

The emphasis must be on prompt approximations rather than on out-of-date historical records. Spread around the world in half a dozen countries there is today the *expertise* and the highly specialized know-how required for doing the job. At present, however, it is being used piecemeal at national level or by private enterprise, yet because all commodity markets are international in character, it is essentially a job for international co-operation under the sanction of international agreement. In such an agreement there should be no suggestion that statistics are being prepared either to prove or disprove a case for commodity control. The job should be done simply because without accurate and prompt information, the kind of market fluctuations and strains with which we have so long been familiar must inevitably continue.

## REVISED LEGISLATION FOR NORTHERN RHODESIAN MINING

New mining laws for Northern Rhodesia were accepted in principle on March 27 when the Mining Bill passed through its second reading in the Legislative Council. These laws have taken thirty years to come before the Legislature; the reading took less than two hours. There was general agreement on the Bill, which replaces the existing Mining Ordinance, enacted as the Mining Proclamation of 1912.

Introducing the second reading, the Member for Mines and Works, Mr. W. G. Dunlop, said that the value of Northern Rhodesian mineral production for the year ended March 31, 1914, was £49,000 compared with £130,000,000 for the year ended December 31, 1956. He added that it was not surprising that with the development

of the Territory since 1912 the present ordinance was out of date. The work of revising it had been continuing since 1928.

All the provisions of the new Bill, of which several are important, have been agreed to by the British South Africa Co. The new legislation vests the mineral rights of Northern Rhodesia in the Crown, subject to existing rights vested in the B.S.A. Co., and to existing and future rights vested in persons deriving title from that company. The speaker added, "As far as this government is concerned, it recognizes that B.S.A. owns mineral rights, and that these rights are valid and cannot be challenged. Under an agreement concluded in 1950 the company will give up all its mineral rights on October 1, 1986. From that date these rights will vest in the Crown".

Landowners acquire considerable protection under the new legislation. Prospectors will be required to give notice of their intention to exercise their prospecting rights on private land including native reserves and native trust land. They will also be called upon to make good damage to the surface of the ground caused by the removal of buildings on the termination of prospecting. Provision is also included for the payment of compensation in certain cases.

The legislation places the North Charterland Exploration Co., which holds mineral rights over about 10,000 sq. miles in the Eastern Province, in the same position as the B.S.A. Co. with regard to prospecting licences. "It is hoped that this measure will lead to an increase of prospecting in the area", said Mr. Dunlop. The Bill provides for those prospecting without authority to be fined or imprisoned. Prospectors who have obtained prospecting licences must register with the government before beginning operations.

## AUSTRALIA'S SEARCH FOR TIN ORE

The commencement of operations by The Broken Hill Proprietary Co.'s tin plate works at Port Kembla, New South Wales, has emphasized the weakness of Australia's tin production. Prior to the establishment of the works, domestic needs necessitated the importation of some 500 tons of tin metal per year. Consumption will now increase from the vicinity of 2,000 tons to about 4,000 tons of metal per year.

There is agitation for the Commonwealth Government to encourage the search for tin deposits. Chances for the discovery of alluvial tin occurrences of commercial importance are remote, but lode tin deposits offer a field for exploration and prospecting.

The Commonwealth Government considers that there are reasonable chances for success on the Maranboy field, in the Northern Territory, originally worked extensively to a shallow depth by small operators. The field has been taken up by United Uranium, N.L., which is carrying out underground prospecting, with encouraging results. In our issue of March 28 it was pointed out that the government has decided to assist at Maranboy by putting down a series of diamond drill bores, the cost of which will be repaid by the company if and when the stage is reached of production of tin oxide concentrates.

There is report of an encouraging tin deposit some 100 miles to the north-east, which suggests importance. Apart from the Northern Territory, there is scope for prospecting in New South Wales, Queensland and Tasmania. The search would be furthered by extension of government geological work and drilling, and particularly by reconsideration of the taxation aspect.

# The Mineral Deposits of Cuba

**A**S in many countries containing much and varied mineralization, promotional activities in Cuba have tended to obscure real values. The complex faulting found in all mining districts makes prospecting difficult, as does tropical soil cover. However, in many cases trenching will uncover recognizable rock, and geochemical techniques should prove suitable for prospecting.

The complexity of the Cuban deposits in many cases, but by no means in all, renders both drilling from surface and geophysical activities difficult to plan and interpret, thus forcing work underground. As long as this underground work is treated as prospecting and early development, results can be obtained at low cost, but too often going underground has convinced owners that they have a mine, and costs have soared out of proportion to the work done. On the other hand, some owners have successfully used underground works to bring in medium-sized mines with the advantage of a small initial production.

## The Role of Legislation

Local mining laws allow claims to be kept without any development, which is not conducive to mining progress. On the other hand, local capital is available for equipping mines once they are beyond the exploration stage. Cuba has poor communications beyond the main roads but distances are so small that this is not a serious drawback. Labour is plentiful. Most important to small mining is the range of services obtainable within the country, usually at distances developing mines in Continental countries would envy. The Cuban desire, regardless of politics, to break from a single economy—sugar cane—should provide a favourable climate for mining development.

Although nickel mining is the latest mining industry to be developed in Cuba, it is, nevertheless, the largest. Other and considerable operations are bent upon the exploitation of copper, manganese and refractory chrome. There exist also deposits of barytes, lead, zinc, gold, tungsten, coal and oil. In the past, iron was mined on the island.

Nickel in Cuba occurs in large, low-grade iron ore deposits situated in the vicinity of Nicaro in Northern Oriente Province. The large leaching plant erected by the U.S. Government during World War II made possible the extensive deposits. The plant is now under private ownership and is supplied by the opencast operations of both owners and tributors.

Somewhat similar deposits of nickel are reported on the north coast of Pinar del Rio, but these have not as yet been exploited owing to their distance from the leaching plant. Indeed, the Pinar del Rio ores have not even been fully investigated. On the road north of Pinar del Rio there is a

A large and wide variety of minerals occurs in Cuba, and favourable conditions exist on the island for the development of mines on small capital. In the following article the author, a field engineer of Mackay and Schnellmann, describes the mineralization of Cuba, pointing out that local mining legislation is not conducive to development although capital is available on the island to equip mines once they have passed the development stage.

and in Matanzas, the latter deposits also being of considerable value. A deposit blocked out north of Cienfuegos in Las Villas Province has not been mined. This site contains irregular copper values. An old gossan working in Pinar del Rio revealed blocked-out low-grade copper bodies which soon are to be mined by opencast operations.

Another pyrite deposit near Matahambre has revealed low values of zinc, copper and lead. Should a pilot roasting and leaching plant prove successful, this body will be mined by underground methods. In the far west of Pinar del Rio, large iron ore deposits are reported, but their size has not been proved.

## Widespread Copper Deposits

Copper is certainly the most widely spread mineral in Cuba. Mention has already been made of its association with large deposits of pyrite, while in many cases high copper values are found also in small pockets and stringers. These were valuable in the past but are not so at the present day.

At Matahambre, however, large chalcopyrite shoots have been mined since 1912, feeding a 1,000-ton per day mill with heads as high as 11 per cent in the past and rarely below 5 per cent currently despite a working depth of 3,500 ft. The shoots are elongated in depth and consisted originally of two, now worked out. The shoot presently being exploited does not outcrop and has already been followed to the 3,700 ft. level.

The shoots are based on a large fault striking north-south. Yet the fault is not traceable far on the surface, though very strong in depth in common with other faults, and wedges are formed to be repeated by minor faults and central individual orebodies. The country rocks are sandstones and black shales and no impregnation of country rock occurs. Chalcopyrite is now the only ore mineral.

Development is very difficult, as underground diamond drill holes can miss the orebody by a fraction without giving any indication of its existence. For this reason 5,000 ft. of drilling is completed each month at this site.

Due to a union struggle which renders the dismissal of miners exceedingly difficult, the labour force is maintained as it was required at a much earlier date, and thus there is little incentive to improve mining practice by mechanization. Heat generated by the oxidation of the pyritic orebody, practically 100 per cent humidity, and the considerable depth make the mine uncomfortable. Stopping is by cut and fill in stopes up to 50 ft. wide. These normally stand well. Some stopes, however, provided difficult mining

By D. J. SIMMONS, B.Sc., A.R.S.M.

pyrrhotite prospect where some underground workings have been completed. Except for iron pyrites, iron ore itself is no longer mined in Cuba.

Pyrites bodies with high-grade gossans were mined in North-East Pinar del Rio as well as in northern Havana

problems owing to bad ground. Nevertheless, these stopes were exceptions. Mill sands are used as fill. Hoisting is accomplished in one shaft extending vertically to the 3,700 ft. level. Concentrates are transported to the coast by aerial ropeway.

A zone of faulting extending south-west from Matahambre to Guane contains many copper prospects and is loosely termed the Matahambre line. Two other mines exist in this district. The Francisco Mine—recently closed down—milled 300 tons a day at 4 per cent heads from a chalcopryite body up to 50 ft. wide but of very limited strike. A single shaft extends to 400 ft. with three main levels. The Dora Mine mills 150 tons a day with limited reserves.

Many small mines and prospects developed from 1910 to 1930 have produced small lots of high-grade ore, but are now inaccessible due to flooding. Much surface diamond drilling both around the major mines and on prospects has yielded no results. It may be, however, that in these types of deposit little can be proved by drilling from surface. On the borders of this line chalcopryite is mixed with galena and gives way completely to galena and barytes in many cases.

In Las Villas Province, besides the pyritic body mentioned, there are in addition many prospects in the area north and east of Cienfuegos. Some tend to be irregular bodies with uncertain connections but one at least—near Bonajagua—is proving to be a profitable mine as more orebodies are being found as mining continues. The occurrence is on a contact zone and the copper is found with zinc in pyrite bodies. The mill already handles 200 tons a day, which is soon to be doubled. Heads are about 4 per cent Cu.

Camaguey Province has no working copper mine, but contains several promising areas. One prospect north of Satibonica has been drilled and examined by geophysical methods over a strike of nearly two miles. North-east of Camaguey town, near Minas, there is a very old copper mining area of the 1850's which, despite later favourable reports, has never been developed subsequently either by drilling or by underground work.

#### Copper in Oriente Province

Oriente Province contains several copper prospects, many only being rich stringers. In the 1840's the famous El Cobre Mine was the largest copper producer in the world and recovery was of a fantastically high grade. The orebodies had a limited strike of 800 yds. but they made a width of as much as 300 yds. with intermediate mineralization. The copper was all in oxidized minerals, the top 30 ft. being black oxide, and all known copper minerals were said to be represented.

Mining so large a deposit was a major problem in those days and extensive caving ruined the mine. Production has been carried on to the present day, an inadequately equipped mill spasmodically treating ore shovelled from the caved surface and ore hand-picked from dumps by tributors. The product runs over 25 per cent.

The surrounding veins have proved disappointing in tonnage but are by no means completely explored. At present a local subsidiary of a large American company is diamond drilling below the old workings in the hope of proving sufficient chalcopryite reserves to justify a deep shaft and also the mining of the remaining oxidized area by caving.

Oriente is the main manganese-producing area of Cuba, the deposits occurring on the northern flank of the Sierra

Maestra and in the passes north of Santiago de Cuba. The mines are mostly small and produce only when the price is high. One, Charco Redondo, is a steady producer and other small but steadily producing mines could be organized. The provision of a central washing plant during the war years revealed how this aided production.

#### Other Deposits

Manganese usually occurs in bedded formations, not always of secondary origin. Much faulting complicates exploration and accounts for the generally small-scale operations. Much excellent work on the geology of these deposits has been accomplished by the U.S. Geological Survey. Mining is primitive, pillar and stall methods being mainly used, the pillars being left *in situ*.

In Pinar del Rio Province, low-grade secondary deposits are reported on the north coast. These have not been worked. Other areas of Cuba have produced manganese; i.e., minor deposits in the Pinar del Rio limestone.

Open pit methods are used to mine chromite. The grade is refractory. The mineral occurs in Camaguey and Las Villas Provinces and is associated normally with serpentine. The deposits are extensive.

Lead and zinc do not often occur as a mixed ore. Several cases of the association of lead and zinc with copper ores have been mentioned. Rich veins of galena are found in the area east of Guane in Pinar del Rio, but apparently are limited in size. It is hoped that a rather premature lead smelter in the area will treat ore from several mines as yet undeveloped. Along the north coast of Pinar del Rio galena is associated with barytes, while at San Diego de Nunez a reportedly rich old silver mine has lead slags around the surface near the old smelter site. Trenching is necessary to discover the old workings, which are completely invisible.

Barytes is found with lead and copper mineralization in Pinar del Rio and also individually, and although of poor colour, is of good density. It is mined in two localities, and in both cases the quarries are on hills formed by a stockwork of veins. The larger is on the road north from Pinar del Rio to Matahambre, while the other is north of Consalacion del Norte. Other deposits are known near San Juan Martinez, as well as in the north.

#### Association of Gold With Copper

Gold is probably often associated with copper and was found in early Spanish times in alluvial materials now long since worked out. At Guimano in Camaguey, a gold quartz vein with irregular copper values is being examined by drilling and mining. Some production was obtained before the Second World War. Holquin in Oriente was the centre of a gold industry, the mineralization being arsenopyrite. The mines are now flooded except in a few areas where small-scale work is carried on. Although gold in the surface material is reported, no large-scale exploration has tested the possibilities of Cuba's gold deposits. Several of the gold mines also contained copper.

Despite a fair amount of drilling in several provinces, no major Cuban oilfield is in existence. The only real producer is situated near Satibonco. Large areas of Camaguey, Las Villas and Pinar del Rio have not been explored, despite the fact that they are covered by prospecting rights, but a fair amount of structural geology has been completed. Coal is reported in several areas but is for the main part of lignite rank and the possible extent is not proven.

## The Convertol Process

**I**N this country the tendency has been to use froth flotation for the recovery of fine coal from slurries but in Germany an agglomeration process, perhaps reminiscent of the old Trent "coal amalgam" process, has been employed for some time and was described by Lemke at the Second International Coal Preparation Congress at Essen in 1954. The process has recently been investigated by the U.S. Steel Corporation and two units are now in operation.

The Convertol process is said to have been found to be very effective for removing usable coal from high-ash slurries and the product obtained is fluffy and non-dusting and, therefore, easily mixed with the washed coal. Certain refinements must still be made in control of the process to permit maintenance of high recoveries with minimum oil consumption. It is stressed that oil consumption is primarily a function of feed size and oil type.

### Operation of the Process

The process consists of thickening the slurry to 40 or 45 per cent solids then mixing with the oil in a phase-inversion mill, subjecting the pulp to conditioning and finally separating the agglomerated coal by means of a basket-type centrifuge. In tests when the feed was made finer the centrifuge became overloaded and was replaced by a vibrating screen fitted with sprays which effectively separated the agglomerated coal which was then dried using a solid bowl centrifuge. The convertol, or phase inverter, simply resembles a disc grinder in that the feed and oil are forced into a thin layer between the moving and fixed plate and presumably the addition of a conditioner before separation, compacts the flocs in a similar manner to the agglomerated manganese fines in the new flotation process for these ores.

Large quantities of oil are required, amounting to between 2 and 8 per cent of the product, and light petroleum fractions appear best from the point of view of consumption but heavier oils (which may require heating to disperse) produce more strongly agglomerated concentrate whilst the more common tar oils have not been found very satisfactory.

## Concrete Headgear by Continuous Pouring

**T**HE new 132 ft. headgear for No. 12 Prain Service Shaft at Mufulira West is the product of the continuous pouring system that is unique on the Copperbelt. The headgear was raised in ten days of operation. Although the headgears at Bancroft and Chibuluma are of concrete, their design precluded the use of the sliding system whereby the structure was raised at Mufulira.

Twenty-four hydraulically-operated jacks moved up vertical steel rods which carried the working platform and shuttering at an average of 6 in. per hr. The 160 ft. steel tower, raised before the work started, was used to hoist the concrete mix and drop it into a movable chute, whence it was poured into the moulds. As soon as the concrete set sufficiently to carry its own weight and the jack rods, the jacks and formwork moved upwards and the cycle was repeated.

The amount of concrete poured into the £28,000 structure totalled approximately 1,000 cu. yds.

Roberts Construction Co., who built the No. 12 Prain Service Shaft at Mufulira, claim several distinct advantages from the use of concrete. These include safety considerations, lowered costs, especially with regard to maintenance, and a clean design, as concrete headgears are so heavy that their weight counteracts rope stress from the winders. This eliminates the need for backlegs and the immediate vicinity of the shafthead is uncluttered. Speed of erection is another consideration, as is the problem of obtaining supplies for a traditional headgear construction.

## Sintered Metal in Earthmoving Equipment

**A**N important step recently has been taken in the development of sintered metal and cerametallic friction materials in this country. These materials are designed for the control and transmission of power in excavators, cranes, earthmoving machinery and tractors.

Ferodo Ltd. has entered the field of sintered metal production on an ambitious scale, providing sintered facings for new clutch and brake designs as well as a comprehensive range of replacement metallic facings. The company benefits in the design of production plant by the experience of the S.K. Wellman Co. of America, who largely pioneered the application of sintered metals to the brake and clutch-lining industry, and in collaboration with whom Ferodo Ltd. is already manufacturing these products on full-scale in the U.K.

### Beyond Conventional Scope

Until now conventional friction materials, based on asbestos, have fulfilled all the demands made upon them. Ferodo sintered metals will not replace asbestos-based products. They will, however, make possible the design of clutches capable of sustaining duties beyond the scope of conventional linings and facings. They will also provide a Ferodo quality for replacement linings and facings on heavy equipment, mainly of American design, which have standardized metallic facings for certain brake and clutch applications.

Sintered metal linings are produced by the compression and partial fusion of very fine particles, mainly of powdered metals. Their physical properties, derived from their constituent metals, give them under certain conditions of high unit loading longer life and more stable friction than asbestos-based materials. Their use is justified by their performance under conditions which are beyond the range of conventional materials and where considerations of space make their use essential.

The facings are flat discs or segments generally built on to steel backing or core members, and may be very thin by traditional standards. The complete units may then be mounted by riveting; more frequently, the core member may be gearcut or splined to transmit torque. They are supplied for dry operation or in oil-immersed conditions, and give excellent service against normally accepted steel or alloy mating members, that is to say, with a Brinell number of 160 or more in dry applications, although a lower Brinell number is acceptable for oil-immersed conditions. Cast steel is unsuitable for use as mating members, since it is liable to be scored by whatever friction material is used.

## MULTI-ROPE WINDING—II

## Testing the Multi-rope Winding System

**W**HEN it was decided to have a full-scale test of the new winding system, permission was obtained from the Anglo American Corporation of South Africa, Ltd., to make use of a steam winding installation situated at Springs Mines.

The shaft has five compartments, is rectangular in section with 4 ft. between guides; the depth is 4,000 ft. to the main station and it is served by two steam winders, one manufactured by Fraser and Chalmers and the other by Markhams Ltd. The winder chosen for the test was the Fraser and Chalmers's unit serving compartments Nos. 3 and 4, as it was the more suitable for conversion to the multi-rope system. This winder normally operated with 1½ in. dia. ropes and was commissioned as a dual-purpose unit. The drums are 11 ft. dia. by 8 ft. 3 in. wide and the headframe sheaves are 14 ft. dia. For the purpose of this test, the 14 ft. dia. sheave in No. 3 compartment was removed and replaced by two 6 ft. dia. sheaves spaced at 2 ft. 6 in. centres. This was the only modification required to the headframe.

The skip and bridle, which weigh eight tons, required no modification other than fitting the compensating device, which has a 2 ft. 6 in. dia. rope wheel to match up with the headframe sheave centres.

The right-hand drum of the winder serving No. 3 compartment, previously grooved for the 1½-in. dia. rope, was fitted with a wrapper plate to ensure good coiling of the smaller dia. ropes which were to be used for the test, and a division was fabricated in the centre of the drum width to provide facilities for multi-ropes. This division was constructed of a 6 in. by 4 in. channel, rolled to suit the circumference of the drum and bolted to the tread. The original rope lead-in port adjacent to the drum flange was utilized for one rope attachment and an additional port was drilled adjacent to the centre division for the other; the spacing is such that there are the same number of coils on each division. This ensures better distribution of load on the drums and, for the same end loading, reduces the bending moment on the drum shaft.

It is most important that the ropes coil correctly and for this reason, and to safeguard against unequal tension in

A paper by R. Blair, M.I.Mech.E., M.S.A.I.Mech.E., in "Journal of the Institution of Certificated Engineers", Vol. 30, No. 6, South Africa, described a new type of drum winder, designed to meet the requirements of deep-level mining with increased loading. The following article, the second of a series, is condensed from this paper. By using multi-ropes attached to each conveyance, smaller diameter ropes, sheaves and drums can be used. The illustration depicts the compensating device attached to the conveyance.

the event of faulty coiling, a device is fitted adjacent to the drums. This device follows the correct sequence of coiling but, should faulty coiling occur at any position during the wind, contact between the rope and the device causes the safety circuit to open and trip the winder.

## Compensating Device on Conveyance

The compensating device is attached to the conveyance and, whilst there are two ropes attached, the centre wheel or drum is free to rotate. The rope attachment is positive because after passing two turns around the periphery each rope is led through an opening in the circumference, looped around the boss and finally clamped by means of Crosby-type clamps. This provides facilities to cut for test and at the same time allows sufficient rope to cater for any faulty coiling on the winder drum. The ropes around the periphery are in a spiral groove; therefore, should there be any movement due to unequal rope travel, the one rope leaves the groove as the other enters.

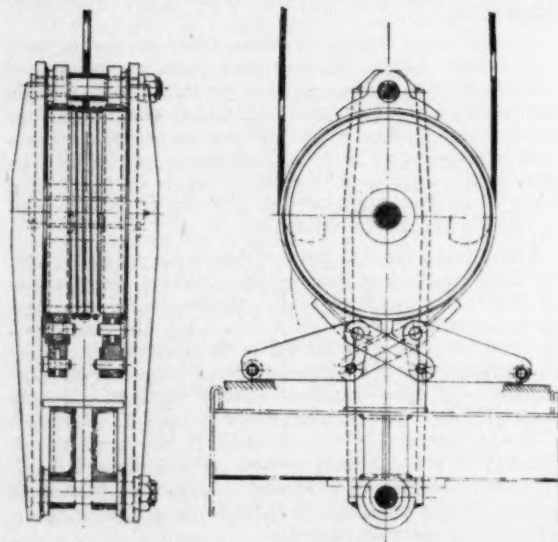
The two ropes can be installed having opposite lay thereby eliminating the side pressure which is always present on shaft guides when using rope other than non-spin type on a single rope system.

The band brakes on the compensating device are applied automatically by the side thrust induced by the weight of the conveyance if either rope should break, and they can operate only in the event of a broken rope, as they are controlled by the weight of conveyance attached to the rope. The brake pressure is set at a predetermined loading and will then automatically adjust the pressure applied according to the weight of material, mineral or persons in the conveyance.

By varying the amount of travel of the device the side thrust applying the brake can be controlled; the greater the amount of travel permitted, the lower the side thrust, therefore the thrust is decreasing as the rotation of the compensating wheel is being arrested.

In the test administered when compensating for equal tension and arresting the conveyance with a broken rope, the one rope end leading into the hub was in a horizontal position and the conveyance supported equally by both ropes. A pennant rope was then attached to the winding rope on the right and with the aid of a capstan winch, was raised to produce the same effect as would be experienced by faulty coiling on the winding drum. The result was that the wheel of the compensating device was rotated with the movement of this rope and it was obvious that although the wheel was rotating the tension in both ropes remained constant.

Having conducted this test several times it was then decided to prove the broken rope condition. For this test, the conveyance was again raised by the same method as



described previously. The pennant supporting the right-hand rope was severed and the device heeled over to the right, applied the brake and arrested the rotation of the wheel. This test produced a condition similar to that of a broken rope.

A further test was conducted by actually severing the rope with the use of explosives, proving that there was no retardation or false condition resulting from the use of the pennant and capstan winch during the previous test. When the conveyance was raised into a position at 3 ft. 4½ in. on a scale marked on the shaft guide, the explosive charge was attached by means of a clamp to the winder rope, slightly above the compensating device. The explosive was detonated from a safe distance by igniter cord.

#### Experiments in Breaking Rope

When it was decided to use explosives rather than a mechanical method to sever the rope, a sinking bucket filled with scrap iron (weighing in all 4 tons) was suspended approximately 2 ft. above the ground by a steel wire rope 1 in. in dia. and having a breaking load of 48 tons. Eight 60 per cent gelignite primers, 4 in. long by ¾ in. in dia., were tied lengthwise around the circumference of the rope. The explosion merely removed the rope dressing.

In the next experiment the explosive charge was divided into two, one charge above the other on opposite sides of the rope. This method was more effective, and after a series of tests during which the amount of explosives was gradually increased, the rope was broken successfully with 5.56 lb. of explosives.

An explosion of this order, however, would have been too great for use in the timbered shaft in which the main test was to take place. It was, therefore, necessary to find some means of breaking the rope with a smaller charge. It was realized that the initial force of the explosion was probably being expended on flattening the rope before starting to break it and a type of shear plate was made to hold the cross-section of the rope rigid and to act as a guillotine against which the rope would be cut rather than broken when the explosion took place. This proved to be so effective that the rope could be broken with a total charge of 3.64 lb. of explosives. This explosion was still too big, however, and it was found by using gelignite cartridges of 2 in. dia., moulded to fit in close contact with the rope, the maximum effect of explosion was obtained.

The rope used for this experiment was of the same construction as that to be used in the actual winding test, namely, ¾ in. dia., having a breaking load of 27 tons. The rope was broken with 0.48 lb. of explosives which, incidentally, was exactly half the amount of explosives needed to break the rope without a shear plate. As this amount was still excessive for use in the timbered shaft when conducting the final experiment, the author decided to cut away four of the six strands in the rope and sever the remaining two by the method described, thereby utilizing the minimum amount of explosives; the final test was conducted by this means with the amount of explosives reduced to 2 oz.

The next problem was to arrange to detonate the explosives at the correct position in the shaft when the conveyance was ascending at full speed. To avoid placing the full responsibility of split-second timing on the winding engine driver, it was decided to avoid the use of fuse or other timing mechanism, and to keep the exact timing of the explosion in the hands of the person conducting the experiment; therefore, the method of detonation employed was to send a high frequency signal down one winding rope and to use the signal to detonate the explosives. The advantage of this procedure was that the detonation could be

effected at a time when the position and speed of the conveyance was as required.

For this operation, a Carrierphone equipment was installed, consisting of a 100 kilocycle transmitter, electromagnetically coupled to the winding rope near the headframe sheave, using a toroidal coil through which the rope could travel. A battery-operated receiver tuned to 100 kilocycles was placed in the conveyance and electromagnetically coupled to the winding rope by a coil fixed on the rope just above the compensating device. The receiver was fitted with a relay which, upon receipt of a signal impulse from the transmitter on surface, applied six volts from the receiving battery to the detonator and exploded the charge.

As it was decided to conduct the test with the load ascending, the conveyance was lowered to the bottom level 4,000 ft. below surface. The winder was then accelerated to full speed, that is over 3,000 f.p.m., and when this speed was attained the charge was ignited and the right-hand rope severed. The winder was then brought to rest at normal deceleration rate, which amounted to approximately 10 turns of the 11 ft. dia. drum, or say, 350 ft. of rope travel.

Without further inspection the conveyance was raised at slow speed, and when approaching the surface, it was obvious that the broken rope had twisted around the other. However, this was of no consequence as both ropes travel at the same speed in the shaft.

It must not be wrongly construed because the author has tested and proved the system to be safe even with a broken rope, that this condition is anticipated. On the contrary, with the introduction of the compensating device which has an indicator fitted and will show at a glance any deterioration of either rope, there should be adequate warning to enable the faulty rope to be removed before a disaster can occur.

#### Detection of Broken Rope

A method of detecting a broken rope and of stopping the winding system automatically in this event can be included. However, the immediate and certain detection of a broken rope presents unusual difficulties as the two ropes are electrically inter-connected at top and bottom.

It is, therefore, convenient to regard the two ropes as forming a short-circuited loop, whose interruption must be detected electrically, and this suggests the employment of a high-frequency current which can be readily induced into one rope by a toroidal coupling coil, mounted around it in the headframe and detected by a similar coil mounted around the other rope.

In practice, one coil would be connected to a stable high-frequency oscillator and the other to an amplifier detector and relay. The system has the advantage of failing to safety.

The two ropes, however, are very close to one another and are strongly coupled both inductively and capacitively; it can be shown that complete fracture of one rope would cause practically no reduction in the current in the detector coil under certain conditions. This surprising effect is due to the generation of standing waves wherever the length of the rope between sheave wheel and break approximates to one-quarter of a wave-length at the frequency used. In order to prevent this effect, it is necessary to ensure that the total depth of the shaft does not correspond to more than about a tenth of a wave-length, which for a 6,000-ft. shaft, limits the frequency used to not more than 16.5 kilocycles.

At this frequency a toroidal coil is very inefficient, so that increased power and detector sensitivity must be employed. Construction of equipment for this purpose is now being considered.

## Machinery and Equipment

# MOBILE MUD TANKS

First of their type, two of the largest mobile tanks designed to carry drilling mud were shipped recently to Compania Shell de Venezuela Ltd. for use in the oilfields. Costing about £7,000, each consists mainly of a 4,500 imperial gallons (5,400 U.S. gallons) gross capacity vacuum tank with engine and compressor, mounted on a 50-ton heavy-duty semi-trailer of special design.

Manufactured by Bristowes Machinery Ltd., of Edmonton, North London, to Shell's requirements, each of these mud tanks is 27 ft. in overall length, 6 ft. in diameter, and is fitted with access catwalks and four inspection manholes in the top. Filling is by vacuum and discharge by compressed air, at a pressure of 30 lb. per sq. in. The reciprocating compressor is coupled to a Perkins S6 diesel power unit, both units being carried on the raised front deck of the semi-trailer. Built by R. A. Dyson and Co., the semi-trailer is designed for use with a Scammell 6 by 6 tractor.

## TWO NEW TRACTOR EQUIPMENTS

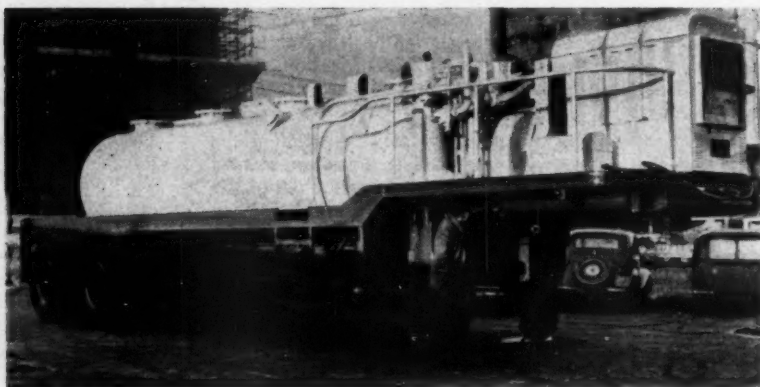
The Allis-Chalmers Manufacturing Co. have recently announced two new equipments for their H.D. 21 tractor. The first of these is a coal handling blade for use with cable or hydraulic bulldozers. With a width of 15 ft. and height of 4 ft. 8½ in., it is capable of moving 15 tons of coal at a pass. Boxed-in ends to the blade prevent excessive spillage.

The second new equipment is a lift tongs attachment for the H.D. 21GC tractor-shovel. Fitted in place of the standard 4 cu. yd. bucket, it has a lifting capacity of up to 41,000 lb. The distance between the tine jaws is 5 ft. 4 in. and each set of tines has a clamping force of 20,000 lb.

## MASS-IMPREGNATED NON-DRAINING CABLES

The tendency of the compound to migrate when conventional types of impregnated paper insulated cables are installed vertically or in a steeply inclined position is well known. This can occur even at normal temperatures, frequently with the serious result that voids are created in the insulant which may lead to breakdown, while the draining of compound into junction boxes and switches may result in damage to contacts.

The mass-impregnated non-draining cables manufactured by the Telegraph Construction and Maintenance Co. Ltd., have been designed to overcome these difficulties, and give freedom from migration even when installed in vertical runs and operated at the maximum permissible working temperature.



The mobile mud tank and ancillary equipment mounted on the semi-trailer

This has been achieved by the development of a special compound for the impregnation of these cables, which is the subject of a British patent. The important characteristics of this compound are its comparatively high melting point (88 deg. C. Ubbelohde) and its high viscosity (24 c.s. at 120 deg. C.). These are the characteristics which determine the tendency of the compound to drain from the cable at elevated temperatures and whereby the drainage test specified in B.S. 480 can be satisfied.

It is important that the compound should be reasonably soft at normal temperatures so that the cable will withstand bending requirements, as, for example, during laying, without damage to the papers of the dielectric. This requirement, and also the provision of good dielectric properties, has been the subject of careful study in the selection of the ingredients used in the manufacture of this special impregnating compound.

## NEW NYLON TUBING

Tecalemit announce a new range of nylon tubing, the result of development and research in co-operation with the producers of the raw material in Europe and the United States.

Tecalemit nylon tubing is made of light-weight, tough, heat and ultra-violet light resisting material. There are numerous applications for this tubing which is resistant to oil, grease, and most chemicals. It can be used as lines for lubrication, hydraulic control, air, fuel and oil, chemicals, vacuum, coolant and liquid foods and applied to cars, commercial vehicles and industrial machinery of all kinds. Considerable weight saving is effected. The tubing can be visualized as having applications in mining.

There are two types of Tecalemit nylon tubing available: the semi-rigid (TTR), which is extremely pliable and easy to install; and the flexible (TTF), which is superior in performance to many other types of flexible tubing. In both cases the tubing is claimed as virtually indestructible.

The semi-rigid tubing, supplied in black, is heat and light stabilized. This ensures that no degradation occurs when exposed to strong ultra-violet light or oxidation when working at continuous elevated temperatures over long periods. Thus the tubing can be used with assurance on all outdoor applications in arctic winter and desert summer conditions and even when in continuous

proximity to existing sources of heat.

The TTR nylon tubing is available in two grades, either high pressure with short time burst pressure rating of 2,500 p.s.i. or low pressure with a short time burst pressure rating of 1,000 p.s.i. Both grades are precision extruded to the very closest limits of + 0.000 in. to 0.003 in. or - 0.005 in., according to outside diameter, and are thus perfectly suitable for use with standard compression fittings. The semi-rigid tubing is available with a range of outside diameters varying between ¼ in. and ½ in.

The TTF flexible nylon tubing, with appropriate end fittings, will replace rubber and other conventional flexibles for a wide range of purposes. The maximum working pressures depend on operating conditions. This tubing is available with outside diameters of ⅜ in. and ½ in. Other sizes than those mentioned, up to ¾ in., can be extruded for reasonable quantities.

## BIGGER AND BETTER CYLINDERS

A new range of large, double-acting cylinders is being introduced by the Maxam Division of the Holman Group. These new cylinders of 8 in., 10 in. and 12 in. bore diameters also incorporate an important advance in cushioning methods which eliminates the necessity for non-return valves in the end caps.

Another feature of the range is the specially designed wide piston, which has a replaceable centre section. This wide piston also ensures greater rigidity of the piston rod when the longer strokes are employed.

The cylinders are of steel, tie-rod construction, and the steel cylinder body has a honed bore which can be chrome flashed if required.

The piston rods (2.484 in. dia.) are of ample proportions for the thrusts encountered and they are precision ground either in stainless steel or high quality steel chrome plated. The 12 in. cylinder operating at air pressure of 100 lb. per sq. in. has a nominal thrust of 10,819 lb. on the inward stroke and 11,310 lb. on the outward stroke.

## CABLE DRUM WINDER

Equipment to facilitate the handling of cables and drums in the repair shop has been designed in the East Midlands Division, N.C.B. The new equipment

enables cable reeling to be carried out by the repair operator without assistance from other personnel.

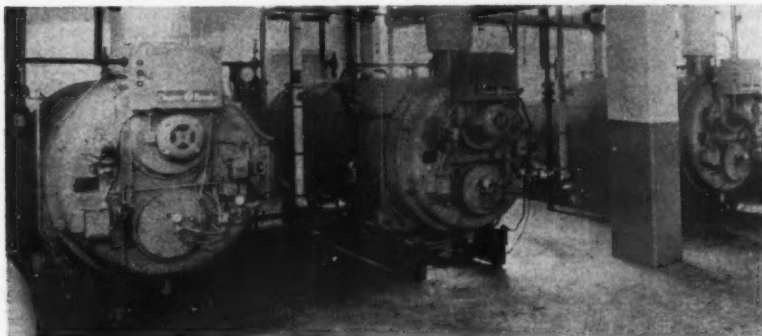
The equipment consists of a ground frame in which a rocking cradle is installed to carry the drum to be wound. The drum rests on two rollers, and the cradle is rocked by a lever controlled by the repair operator.

At one end of the frame, parallel to the rollers, two driving wheels are mounted. These are driven by a motor controlled by a foot switch. When the drum is in place, rocking the cradle brings the drum into contact with these driving wheels, and the lever of the cradle can then be locked in position while winding proceeds.

When winding is completed, the drum is removed by rocking the cradle in the opposite direction, which brings the drum into contact with a ramp. The drum is easily rolled off the cradle and down the ramp. This ramp is built into the ground frame and enables the drum to be easily lifted on and off the cradle.

#### SAFETY SHIELD FOR EXPOSED CONDUCTORS

A new type of fully insulated conductor, designed to prevent the possi-



bility of shocks through accidental physical contact, has been introduced by British MonoRail Ltd. for use on all types of overhead handling systems normally using exposed conductor bar electrification.

The conductor or bus bar is a straight or curved length of channel section— $\frac{1}{2}$  in. wide,  $\frac{1}{4}$  in. deep, and  $\frac{1}{4}$  in. thick—made of corrosion-resistant electro-galvanized steel enclosed in an extruded red p.v.c. sleeve of special design. The shielding is claimed to be foolproof in use—even a man's little finger cannot be inserted to make contact—but the efficient functioning of the sliding-shoe connector is not impaired. The grade of p.v.c. being used has a high dielectric strength, outstanding resistance to a wide range of chemicals, and high physical strength.

A number of accessories have also been introduced, including p.v.c. safety covers, with provision for power feed, which clip over splices in the conductor bars; neoprene caps which fit over the shielding to protect the ends of a system, and insulating sections for use where conductor bars must be isolated.

The system, which is known as Kant-Shock, eliminates all risk of accidents, so that many overhead handling systems

now operating on 50 volts can change over with safety to higher working currents, with obvious economies.

#### HEAD FOR PROP REPAIR

An expanding head, hydraulically operated, has been designed in the North-Western Division, N.C.B., for use in repairing the outer pipe of Dowty props which have been damaged by hammer blows. The illustration shows the arrangement of the head; it is coupled to a hand-operated hydraulic pump with a capacity of  $2\frac{1}{2}$  tons.

When a prop is to be repaired, the expanding head is placed inside the damaged outer tube, and heat is applied to the exterior of the tube by an oxy-acetylene torch. The hydraulic pump is then operated, and the head expands, forcing the dents out of the tube.

#### A RANGE OF HOSES

During the past few years the Goodyear range of hoses which are available to industry has grown to a phenomenal extent. Today, Goodyear offers more than 600 different hoses in no fewer than 52 styles. An entirely new catalogue has

been produced, therefore, and is now available through Goodyear distributors or direct from Goodyear at Wolverhampton.

The new catalogue is divided into seven parts—each part being a complete handbook in itself, and is detachable as a unit from the catalogue cover.

Following an introduction dealing with the characteristics of the main forms of hose construction, there are individual sections dealing with wrapped ply hose, braided hose, hand-built hose, and long length hose. The final two parts deal firstly with the choice and care of hose, and lastly with hose fittings.

#### PACKAGED STEAM GENERATORS IN U.K.

Marshall Sons and Co. Ltd. have concluded a licence agreement for the manufacture of packaged steam and hot-water generators with the Cleaver-Brooks Co., U.S.A.

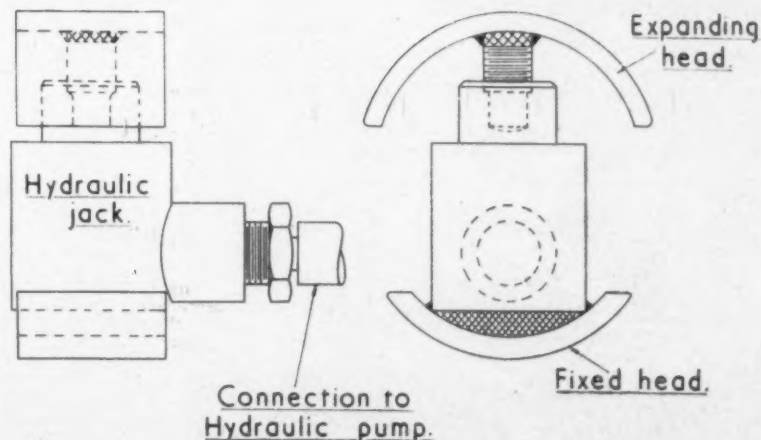
The agreement is for the manufacture of a range of oil-burning fire tube units from 500 to 20,000 lb. steam per hour, with pressures up to 250 p.s.i.g. All these boilers are of four pass design and the advantage of this principle is to maintain a continuously high flue gas velocity essential to high heat transfer by reducing the number of tubes in each successive pass.

As hot gases travel through the first, second, third, and fourth passes, they transfer heat to the boiler water and then cool and occupy less volume. The cross-section of gas flow area (i.e. number of tubes) is then reduced proportionately to maintain high gas velocity, resulting in constant and complete heat transfer.

These higher velocities through the four passes of the boiler literally scrub the tube surfaces clean and increase the heat transfer by improving the gas film co-efficient. Every square foot of tube surface becomes more effective in transferring heat to the boiler water, resulting in highest overall efficiency with low temperature combustion exhaust gases.

The units which Marshalls are to manufacture will be of a design entirely proven by Cleaver-Brooks. The idea of packaging a boiler was first conceived by Cleaver-Brooks in 1931, since which date they have built and sold approximately 30,000 boilers of various sizes and proved the advantages of packaged design in all types of installations.

Above is a battery of oil-fired CB fire tube packaged boilers, each capable of producing 2,760 lb. of steam per hr. Below, the expanding head for repairing the outer pipe of Dowty props



# MINING MISCELLANY

What are reported as "important" deposits of iron ore were discovered last year in the Dominican Republic.

Turkey's reserves of chromite are estimated at around 6,500,000 tons, divided into 4,000,000 tons of metallurgical grade ore, 2,000,000 tons concentrating ore, and 500,000 tons of refractory ore.

Czechoslovak engineers have been at Karabuk, Turkey, studying the possibility of developing the production capacity of the iron and steel works.

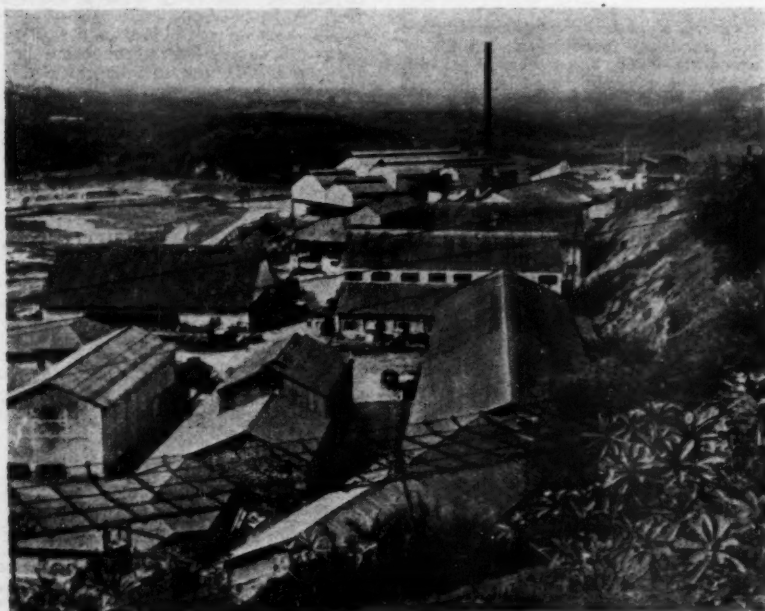
Coal extraction in Turkey was stepped up in 1957 to 6,279,000 tons as against 4,182,000 tons in 1952. It is hoped to reach an output of 10,000,000 tons in two years' time.

Japan Usi Minas Co. has been established jointly with Usinas Siderurgicas Minas Gerais, Brazil, to prepare for the construction of a steel works in Minas Gerais State.

Large deposits of lead, zinc, copper, gold and silver have been confirmed in the Kilien mountains of southern Kansu Province, China. It is reported that iron ore, chromium, manganese, nickel and tungsten deposits have already been found in this area.

Systematic geological mapping of an area covering about 3,500 sq. miles has been completed in parts of Andhra Pradesh, Assam, Bihar, Bombay,

The workshops area at Ariston Gold Mines. In the 1957 financial year, Ariston milled a record tonnage of 470,520 for a gold yield of 145,344 f.oz.



## MINERAL PRODUCTION IN MALAYA 1955-1957

Material	1955	1956	1957
Iron Ore (Production) ... ..	l.tons 1,466,184	2,444,570	2,972,359
Coal (Production) ... ..	l.tons 206,118	182,479	152,711
Ilmenite (Exports) ... ..	l.tons 53,875	122,176	91,734
Bauxite (Production) ... ..	l.tons 222,162	264,444	325,629
Wolfram (Production) ... ..	l.tons 56	48	30
Scheelite (Production) ... ..	l.tons 50	46	19
Monazite (Exports) ... ..	l.tons N.A.	631	490
Columbite (Production) ... ..	l.tons 236	277	142
China Clay (Production) ... ..	l.tons 1,368	1,155	1,510
Gold (Production) ... ..	oz. Troy 22,838	20,252	11,157

Madhya Pradesh, Madras, Orissa, Uttar Pradesh, and West Bengal.

Southern Rhodesia's Mineral production continues to increase. The value of the output for January at £2,323,910 was £259,285 higher than that for January, 1957. It was also £62,800 higher than the December, 1957, figure of £2,261,110. Gold production, however, showed a decline from 45,479 oz. in December to 44,305 oz. in January. The value of the January output, including premium sales, was £553,827 compared with £568,309. There was a jump in silver production from a value of £1,865 in December to £14,742 in January this year. The total base mineral value for January was £1,755,341 compared with £1,690,936 in December.

Next to tin, iron ore now constitutes perhaps the most important mineral production in Malaya. The country's coal is unsuitable for bunkers or for export. The coal is non-coking, but it has been

suggested that experiments should be carried out to establish if this coal may be used as fuel in a local iron and steel industry. During the last three years bauxite production in Malaya has continued a steady upwards trend. Output of both ilmenite and gold has declined.

Italian steel production in 1957 reached the record total of 6,780,000 tons compared with 5,908,000 tons in 1956. Production of pig iron totalled 2,070,000 tons compared with 1,873,000 tons in 1956, but Italy still uses a very high proportion of scrap for making steel and the need for further blast furnaces is under discussion.

The National Development Bank, Brazil, has formally decided to participate in the Japanese steel project, USIMINAS. The undertaking will be composed of 60 per cent Brazilian capital and 40 per cent Japanese. It is hoped to complete the first stage of the factory within 3½ years and the remainder 2½ years thereafter.

A team of mining engineers from Paul Weir Co., U.S., has arrived in South Vietnam under ICA contract to prepare an economic and engineering report on the feasibility of developing a coal field at Nong Son in the northern sector. Dr. Clayton G. Ball, Weir Co. president; D. J. Kachik and Paul Eyrich will spend an estimated three months in the field, with headquarters near Tourane, just below the border separating South Vietnam from its Communist counterpart.

Krupps are said to be interested in the Southern Tanganyika coal deposits and to be negotiating the purchase of substantial amounts. Lack of means of transportation from pit-head to the coast is the biggest single obstacle in the way of the exploitation of these deposits. To Mtwara Port is 300 miles and to the Central Railway the distance is even greater. Tanganyika Coalfields, a Colonial Development Corporation project with authorized capital of £100,000, was formed in 1956.

The Mining Credit Bank opened for business on February 13. The bank has a capital of £78,000,000, of which 25 per cent is held by the Etibank and the remainder by private persons, who between them are said to own about 90 per cent of the chrome mines in Turkey. On the same day, a Chrome Exploitation Co. came into existence as a subsidiary of the bank for the development of the chrome industry.

## Obituary

ROY H. GLOVER

The death occurred in Washington last week of Mr. Roy H. Glover, chairman of the Anaconda Company. He was 67.

Mr. Glover had a distinguished legal career, becoming head of the Montana law firm of Cooper, Stephenson and Glover in 1936. Seven years later, he joined Anaconda as counsel, becoming vice-president and general counsel in 1951. In 1955 he succeeded the late Cornelius F. Kelley as chairman of the board. Mr. Glover was closely identified with the successful negotiations leading up to the enactment of the new Chilean Copper Law in that year.

### PERSONAL

Mr. A. T. Gough has resigned from the board of the Rio Tinto Co. Ltd.

Messrs. S. H. Ekefalk and E. Ryd have been appointed deputy-managers of Atlas Copco AB.

Mr. R. J. Moffat, director-general of marketing to the N.C.B., will retire from the Board's service at the end of June. Mr. F. Wilkinson has been appointed his successor.

Mr. L. Stubbs has been appointed engineer-in-chief (locomotives) of Ruston and Hornsby Ltd.

Mr. N. R. D. Gurney has been appointed sales manager of the Plant Department, Metropolitan-Vickers Electrical Co. Ltd. Mr. O. T. Evans has been appointed chief engineer, Electrical General Engineering Department.

Mr. E. J. Mackenzie Hay has been appointed deputy chairman of the board of directors of National Overseas and Grindlays Bank Ltd.

Mr. M. Prichard, M.C., deputy managing director of F. Perkins Ltd., has been appointed joint managing director of the Peterborough Diesel Engine Co., with Mr. Frank Perkins, now chairman and joint managing director.

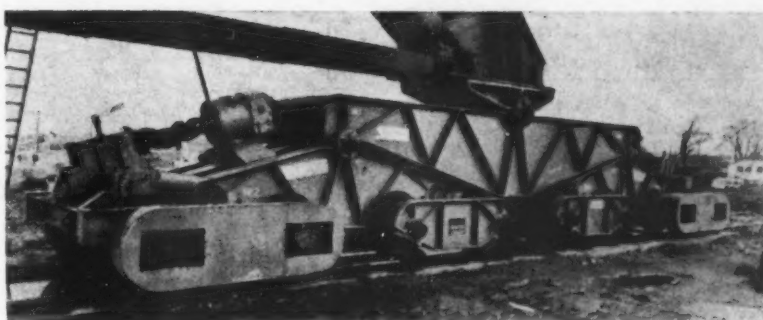
Mr. E. T. R. Ball has been appointed managing director of the British Electric Transformer Co. Ltd.

"The Big Z", a film produced by the Ontario Department of Mines in co-operation with a number of interested mining companies, is now under release. The film describes the discovery and development of the Blind River area. A further film produced by the Ontario Department of Mines is "Forging Ahead in 1957", giving detailed information concerning the mining industry in Ontario during the past year.

### CONFERENCES AND EXHIBITIONS

The annual general meeting of the Cornish Institute of Engineers will be held at the Camborne School of Mines on April 18.

A general meeting of the North of England Institute of Mining and Mecha-



Some of the bogies forming part of the Goliath crane which is assisting construction of a nuclear power station at Bradwell-on-Sea, Essex. The crane is of the overhead girder type, and is the largest of its kind in Britain. It will completely straddle each reactor building during all stages of construction. It is supported at each end by a leg mounted on eight four-wheel bogies. Flexend welding electrodes, produced by Rockwell Ltd., were used in the construction of these bogies. The power station is being built for the Central Electricity Generating Board by the Nuclear Power Plant Co. Ltd. Main contractors for the Goliath crane are Clarke, Chapman and Co. Ltd. and Clyde, Crane and Booth Ltd.

nical Engineers will be held in Newcastle upon Tyne on April 16.

The English Electric Co. Ltd. is demonstrating rectifiers for large industrial drives at Stafford on April 25.

A paper, "Overseas Surveys" is to be presented by Brigadier Martin Hotine at the Royal Society of Arts on April 22.

A private exhibition featuring the complete range of Nife portable safety lamps and accessories for industry, together with specially designed charging and maintenance equipment, is to be held in the Conference Room of the Waldorf Hotel, Aldwych, W.C.2, from April 22 to 25.

### COMPANY EVENTS

It has been announced by the Federation of British Industries that an international organization named MIDECSA was formed recently to further the development of industrial projects in the Middle East in conjunction with Arab and other local interests. The new organization has its head office in Luxembourg, with branches in The Hague and in Beirut. Participating countries at present are Belgium, Canada, Denmark, France, Western Germany, Holland, Italy, Norway, the United Kingdom, Sweden, Switzerland, and the United States.

Short and Mason Ltd. have signed an agreement with Aktiengesellschaft Chemisches Institut Dr. A. G. Epprecht, Zurich, whereby Short and Mason will act as sole agents in Great Britain for the range of Drage instruments.

The name of Associated Drilling and Supply Co. (Overseas) Ltd. (Adasco) has been changed to Le Grand Adasco Ltd. The company will be responsible for all the drilling and soil laboratory work previously carried out by Le Grand, Sutcliffe and Gell Ltd. and Adasco.

The Treasury have made the Import Duties (Exemption) (No. 4) Order, 1958, which exempts methane from duty under the Import Duties Act, 1932. The Order came into operation on April 2, 1958.

### CONTRACTS AND TENDERS

The International Co-operation Administration announces the following future procurements:

#### Korea

Mine safety equipment, various. Bids to Office of Supply, Government of the Republic of Korea, Seoul, Korea. Closing date, April 23, 1958. Ref. ESB/8409/58/ICA. Telephone inquiries to Chancery 4411, extension 354.

#### South Africa

Ten thousand supporting clamps for supporting figure aerial cableway. Bids to chairman, Union Tender and Supplies Board, 291 Bosman Street, Pretoria. Closing date, April 24, 1958. Ref. ESB/8456/58. Telephone inquiries to Chancery 4411, extension 738 or 771.

Responsibility for major purchases for the construction of the International Minerals and Chemicals Corporation potash mine at Esterhazy, Saskatchewan, currently rests with Mr. W. F. Seedorff, Co. Utah Construction Co., 200 Hamilton Street, Palo Alto, Calif., U.S.A. Items needed for mill operations include large drying kiln, constructional steel, conveyors, agitators, crushers, screens, etc. Ref. ESB/651/58. Telephone inquiries to Chancery 4411, extension 776 or 866.

F. E. Bennett and Co., 426 N.W. 6th, Portland, U.S., are interested in receiving offers from U.K. manufacturers of materials-handling equipment, i.e. hoists, conveyors, etc. Ref. ESB/8534/58. Telephone inquiries to Chancery 4411, extension 776 or 866.

American Smelting and Refining Co. has signed a 99-year lease and agreement with the Jack Waite Mining Co., which supersedes a previous 40-year lease signed in 1934. Asarco has agreed to spend a minimum of \$100,000 for additional exploration and development of Jack Waite's properties in the Coeur d'Arden district of Idaho and in Sanders County, Montana. Jack Waite's principal metals are lead, zinc and silver. The new contract is subject to the approval of Jack Waite's stockholders, and the contract will be submitted to them at the next annual meeting.

## Metals and Minerals

# Manganese In The Doldrums

Seldom has the manganese ore market in the United Kingdom been so depressed. For over a year prices have been trending downwards. At the beginning of 1957 about 145d. per l.ton c.i.f. unit was being quoted for 46-48 per cent ore. Because of the scant interest shown by buyers, it is now difficult to determine prices, and throughout the present year quotations have accordingly been described as nominal in our weekly schedule of ore and metal prices. A price list broadly in the region of 100d.-105d. per l.ton unit appears to be currently indicated.

Most consuming countries are reported to have covered their anticipated requirements for 1958, which in many countries are below last year's because of the reduced level of activity in the steel industry. Moreover, the high level of stocks in certain countries had also to be taken into consideration when considering the amount of new ore contracted for during 1958. Whether any marginal tonnages will be wanted over and above those already contracted for remains to be seen; if not, then the outlook for the shipment market is bleak indeed.

The high prices formerly ruling for manganese ore encouraged increased production programmes in various countries, notably Brazil, which has now become an important factor in the world market. Output in that country has been climbing steadily, and in 1957 exports recorded a spectacular jump to 820,000 tonnes, of which the United States bought 400,000 tonnes for stockpiling.

In New York, the feeling in the manganese trade seems to be that any expansion of barter business is highly unlikely. The United States Senate has deleted from the new Agricultural Bill the provision that \$500,000,000 worth of surplus farm items should be made available for barter with other nations. This presumably would eliminate the possibility of any future deals involving American farm goods and manganese ore from India or any other source.

There is some talk in the United States trade to the effect that low-grade manganese ores in the American stockpile may be upgraded. Processors would be paid by giving them a portion of the concentrate. It is understood that some 300,000 tons of ore, averaging around 20 per cent manganese, are involved.

The Indian Government has decided to withdraw restrictions imposed earlier on the free export of manganese ore and allow shippers and mineowners to utilize their quotas freely for the export of manganese ore of all descriptions with immediate effect. In the Government's policy statement on exports of manganese ore for the period from July, 1957, to June, 1958, it had been stated that quota-holders of manganese ore would be required to utilize at least 40 per cent of the quotas issued to them for the export of ore containing 42 per cent manganese and lower.

## U.K. ANTIMONY IMPORT DUTIES

The House of Commons has approved the additional import duties (No. 2) Order, 1958, which increases the rate of duty payable on antimony metal and oxides and on certain antimony alloys and mixtures containing antimony oxides.

Mr. Vaughan-Morgan (Minister of State, Board of Trade) said the increase was necessary since the existing duty was insufficient to protect United Kingdom industry against low-priced imports coming primarily from China and to a lesser extent from Russia. He referred to undoubted evidence of imports of foreign antimony at prices much below those which United Kingdom smelters could economically charge.

It seemed undesirable and unwise, added the Minister, to allow the United Kingdom to become entirely dependent on imported supplies. The additional protection given to this industry against foreign competitors outweighed the very small effect any such increase would be likely to have on the finished products in which antimony was used. The requirements of GATT had been fully met.

## BAIE COMEAU ALUMINIUM

The British freighter *Manchester Regiment* recently finished loading the first cargo of aluminium ingots produced at Baie Comeau, Quebec. The consignment is destined for Britain.

At the annual meeting of the Canadian British Aluminium Co. Ltd., in Montreal, the chairman, Viscount Portal, told shareholders that the company was assured of the sale of its entire output from stages 1 and 2 of the Baie Comeau plant. This derives from a twenty-year contract with the British Aluminium Co., parent of the Canadian company, to take the entire output of 80,000 tons (less tonnage to be delivered in payment of alumina). Viscount Portal also announced that it would now be practicable to advance by about three months the beginning of the operation of stage 2. He said that it would be possible to have a substantial part of this stage ready by October, and that the Quebec Hydro-Electric Authority had agreed to advance completion of the transmission line from October to June, 1959, after which ample power would be available for stage 2.

Kaiser has announced that it will close its aluminium reduction plant at Tacoma, Washington. New cutbacks at its Spokane, Washington, reduction plant have also been announced. Closing down the Tacoma plant will reduce Kaiser's production of aluminium to approximately 400,000 tons annually, or 74 per cent of the company's rated annual capacity of 537,000 tons. This reduction does not take into account the new cutbacks

at Spokane, the extent of which has not been disclosed. These curtailments are attributed primarily to the continued refusal of the General Services Administration to purchase aluminium which, according to the company's contention, the Government is obligated to buy under one of its supply contracts with the company.

It is further reported that Kaiser, following a slight pick-up in orders, has recalled 100 workers to its Trendwood, Oregon, plant and put off proposed curtailment of its operations at Mead, Washington.

The Kaiser Bauxite Co. mined and shipped from the island of Jamaica a total of 3,641,253 l. dry tons of bauxite in 1957.

Canada has agreed to supply 10,000 tons of aluminium to India as assistance under the Colombo plan, as well as 7,500 tons of copper and 500 tons of nickel.

## FREE NICKEL PRICES

The downward drift in free nickel prices does not as yet appear to have been arrested. Buying interest in Europe is reported to be very subdued. Nickel metal is now available at well under £700 sterling a ton; in fact, it is alleged that offers are being made as low as 80 cents per lb. or £640 sterling per ton, with buyers unwilling to pay more than the United Kingdom contract price of £600 sterling per ton delivered at consumers' works.

Present indications suggest that the premium market is virtually out, and it now remains to be seen whether free nickel metal prices will eventually break through the £600 sterling contract price.

Much depends, of course, on the economic climate generally and in the United States in particular. It should be stressed, however, that the £600 sterling paid by the United Kingdom for Canadian nickel cannot be considered unduly high; towards the end of 1950 nickel stood at just over £400 sterling per ton. The present contract price looks cheap indeed by comparison with the recently reduced price of \$1.35 per lb. (£1,080 sterling per ton) c.i.f. Europe for Japanese metal.

## HIGH TEMPERATURE METALS

Columbium and tantalum and their alloys are among the six metals recommended for development into the 4,000 deg. F. range of commercial materials in a survey made by the Aircraft Research and Testing Committee and the Manufacturing Committee of the Aircraft Industries Association, United States. The other metals recommended for development, with their alloys, are beryllium,

molybdenum, chromium, and vanadium.

The survey has revealed that during the next ten years operating temperatures for aircraft and missile materials should reach 2,500 deg. F. for a few minutes' duration and 4,000 deg. F. for some seconds. It is estimated that during the next five years the highest possible operating temperatures will be 1,200 deg. F. for prolonged periods and 2,000 deg. F. for a few seconds.

The potentials of the six listed metals, however, do not end with their usage in high-temperature applications, either as straight materials or as alloys. Indeed, the committees have suggested the investigation of composite materials such as glass-reinforced metals, waffle structures, and cermets, as well as combinations of ceramics and metals.

During the next five years a particular effort should be directed towards improvement in the fabrication of air-hardening stainless and alloy steels, such as 5 per cent chrome work die steels and heat-treatable "straight chrome" stainless. It is also considered necessary to register some improvement in sandwich and other panel constructions.

Yet the quest for high-temperature materials extends far beyond the primary consideration of these six metals alone. The example may be quoted of the possible goal afforded by transparent plastics possessing properties to resist nuclear radiation and serviceable at 700 deg. F. It is also urged that during the next five years glass materials be developed until they are usable in the 1,000 deg. F. to 1,200 deg. F. range. In the next ten years the temperature requirement will reach 2,500 deg. F.

## TITANIUM PRICE CUT

The United States producer, E. I. Du Pont de Nemours and Co., has lowered its quotations on two grades of ductile titanium metal sponge by 15 to 20 cents a lb. The A-1 grade was cut to \$2.05 and the A-2 grade to \$1.85.

Republic Steel Corporation, Cleveland, and the Crane Co., Chicago, have announced their decision to stop making titanium sponge, due to the sharply lower demand, and are turning over to the Government a \$25,000,000 plant operated by their jointly owned subsidiary, Cramet Inc., in Chattanooga. Cramet's production rate was nearing its 6,000-ton annual capacity last year about the time when the United States Government's requirements were being reduced. This is the second casualty of the United States slump in titanium demand, the first having been the closing down by the Dow Chemical Co. of a pilot plant which had completed a contract with G.S.A. for the production of 1,000 tons of sponge.

Yet another casualty is the Stauffer Chemical Co. which has stopped production at two pilot plants turning out titanium sponge experimentally with a process developed by its own research team.

In the wake of the Government's "stretch-outs" and cancellations of defence orders last year, titanium production has slumped for individual companies at least to half of capacity and in many cases to as low as a third or a quarter of full output. Titanium companies doubt whether any sharp pick-up in demand lies directly ahead. They state

that the present emphasis on missiles instead of aeroplanes, together with a tendency in some quarters to lean towards stainless steel for uses in extremely high temperatures associated with supersonic speeds, works against a big rise in demand for titanium.

## MAGNESIUM IN MISSILES

A symposium on existing and future potential uses of magnesium, particularly with respect to the part which the metal may be expected to play in the jet aircraft and missile age, will be held at Los Angeles on June 4 and 5. The joint sponsors are the Magnesium Association and the Society of Aircraft Materials and Process Engineers.

## COPPER · TIN · LEAD · ZINC

### COPPER, LEAD AND ZINC EASIER IN THE U.S.

With the market hardly yet recovered from the Easter holidays, there is extremely little to report, but sentiment has not been helped by the situation in America and the fact that a number of works are unlikely to show interest until next week. In the United States itself, the copper price has lost its recent buoyancy and the customs smelter quotation has been reduced back to the 23½ c. level which last existed on March 24.

In lead and zinc, the price of the former has been reduced to 12 c. per lb. New York, whilst the premiums for high-grade zinc have also been lowered, although the basis price of 10 c. per lb. remains.

### IS TIN ON THE TURN ?

The tin market is still struggling to get off the floor level, and this may now happen in view of the slightly lesser offerings in the East. March shipments from Malaya show a decrease of some 1,500 tons at 3,333, against 4,863 tons for February. Stocks in official warehouses in the United Kingdom showed an unexpected drop of 178 tons to a total of 18,287 tons.

On Thursday morning the Eastern price was equivalent to £739½ per ton c.i.f. Europe.

Closing prices (for four days) are :

	Apr. 2		Apr. 10	
	Buyers	Sellers	Buyers	Sellers
<b>COPPER</b>				
Cash	£176½	£176½	£175	£175½
Three months	£176½	£177	£176	£176½
Settlement	£176½		£175½	
Week's turnover	7,750 tons		8,500 tons	
<b>LEAD</b>				
Current ½ month	£72	£72½	£72½	£72½
Three months	£72	£72½	£72½	£72½
Week's turnover	4,700 tons		2,375 tons	
<b>TIN</b>				
Cash	£730	£730½	£731	£733
Three months	£722	£723	£731	£732
Settlement	£730½		£733	
Week's turnover	1,790 tons		490 tons	
<b>ZINC</b>				
Current ½ month	£61½	£62	£61½	£62
Three months	£61½	£62	£62	£62½
Week's turnover	2,750 tons		6,575 tons	

## LONDON METAL AND ORE PRICES, APRIL 10, 1958

### METAL PRICES

Aluminium, 99.5%, £180 per ton	Iridium, £26 oz. nom.
Antimony—	Lanthanum (98/99%) 15s. per gram.
English (99%) delivered, 10 cwt. and over £190 per ton	Manganese Metal (96% - 98%) £310
Crude (70%) £190 per ton	Magnesium, 2s. 3½d. lb.
Ore (60%) basis 19s. 6d./20s. 6d. nom per unit, c.i.f.	Nickel, 99.5% (home trade) £600 per ton
Arsenic, £400 per ton	Osmium, £20/£22 oz.
Bismuth (min. 1 ton lots) 16s. lb. nom.	Osmiridium, nom.
Cadmium 10s. 0d. lb.	Palladium, £7 10s. oz.
Cerium (99% net), £16 0s. lb. delivered U.K.	Platinum U.K. and Empire Refined £26 10s. oz.
Chromium, Cr. 99% 7s. 2d. lb.	Quicksilver, £77/£78 ex-warehouse nom.
Cobalt, 16s. lb.	Rhodium, £40/£42 oz.
Germanium, 99.99%, Ge. kilo lots 2s. 8d. per gram	Ruthenium, £15/£18 oz. nom.
Gold, 249s. 3½d.	Selenium, 50s. 0d. per lb.
	Silver, 76½d. f. oz. spot and 75½d. f.d.
	Tellurium, 15s./16s. lb.

### ORES AND OXIDES

Bismuth .. .. .	30% 5s. 0d. lb. c.i.f.
Chrome Ore—	20% 3s. 3d. lb. c.i.f.
Rhodesian Metallurgical (semifriable) 48%	£17 5s. 0d. per ton c.i.f.
" Hard Lumpy 45%	£18 0s. 0d. per ton c.i.f.
" Refractory 40%	£12 5s. 0d. per ton c.i.f.
" Smalls 44%	£16 5s. 0d. per ton c.i.f.
Baluchistan 48%	£12 0s. 0d. per ton f.o.b.
Columbite, 65% combined oxides, high grade	nom.
<b>Fluorspar—</b>	
Acid Grade, Flotated Material	£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF <sub>2</sub> )	156s. 0d. ex works
<b>Lithium Ore—</b>	
Petalite min. 31% Li <sub>2</sub> O	47s. 6d./52s. 6d. per unit f.o.b. Beira
Lepidolite min. 31% Li <sub>2</sub> O	47s. 6d./52s. 6d. per unit f.o.b. Beira
Amblygonite basis 7% Li <sub>2</sub> O	£26 5s. per ton f.o.b. Beira
Magnetite, ground calcined	£28 0s./£30 0s. d/d
Magnetite Raw (ground)	£21 0s./£22 0s. d/d
Manganese Ore Indian—	
Europe (46% - 48%) basis 67s. 6d. freight	nom.
Manganese Ore (43% - 45%)	nom.
Manganese Ore (38% - 40%)	nom.
Molybdenite (85% basis)	8s. 5d. per lb. (f.o.b.)
<b>Titanium Ore—</b>	
Rutile 95/97% TiO <sub>2</sub> (prompt delivery)	£39/£40 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO <sub>2</sub>	£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)	87s. 6d./92s. 6d. per unit c.i.f.
<b>Vanadium—</b>	
Fused oxide 90 - 95% V <sub>2</sub> O <sub>5</sub>	£10 per unit c.i.f.
Zircon Sand (Australian) (65 - 66% ZrO <sub>2</sub> )	£16 per ton c.i.f.

## Mining Finance

# Tinto's Higher Profits

Diversification has been the Rio Tinto company's watchword since 1954 when it materially reduced its stake in the Spanish copper and sulphur mines which it had worked for so long. The pay-off of the new policy is now beginning and it comes at a timely moment when the company's other long-held interest, its investment in Rhodesia copper, is producing sharply reduced income owing to the big fall in the price of the metal.

Despite this factor, which presumably was the prime cause of the drop of £874,000 to £2,643,000 in Tinto's investment revenue for 1957, group income less expenditure last year was up by £415,000 to £3,900,000. The tax charge is higher at £2,409,000 against £2,011,000, but this is more than made up for by special credits of £259,000 compared with a debit of £200,000 in 1956, and the group net profit comes out at £1,750,000, an increase of 37 per cent. And this does not include a sum of £380,000, the proportion of profits of Rio Tinto of Canada and subsidiaries attributable to the parent company but not yet available for distribution as dividends.

Tinto's dividend is 26 per cent, less tax, as forecast last October when a one for six new share issue was made. This is virtually the same as the 15 per cent tax free distributed for 1956, but is on a substantially higher capital, increased last year not only by the rights issue but also by the shares issued when Kern Oil was acquired. Pending the greater detail that will appear in the annual report, due to be published about May 8, it must be assumed that it is the oil branch of the company's business that has led to the higher profits. After putting £335,000 to reserves against £525,000 a year ago, Tinto's carry forward is £244,000 up at £1,812,000.

Last year's increased tax charge may raise the question once again in the minds of shareholders as to whether Tinto cannot benefit from the Overseas Trade Corporation tax concessions. It is understood that there is still little chance of this, but it has to be borne in mind that prior to the 1957 U.K. Budget, the group had already arranged its interests abroad in such a manner as to ensure the smallest possible tax burden.

Rio Tinto 10s. stock units stand at 54s. 6d. cum dividend to yield 4.9 per cent. Is this low return justified? Taking a view over the next five years it almost certainly is. The group's huge stake in Canadian uranium will come to fruition during this period. The four operating companies are expected to reach capacity production this summer and until 1962-63 they have an assured government market for their product at a guaranteed price. There will be considerable loan capital to be repaid before dividends can be started, but there is no doubt a large potential source of fresh income for Tinto building up here. The Australian uranium venture, too, is expected to reach the profit-earning stage early next year.

## ASHANTI'S DIVIDEND PROSPECTS

Taxation, politics, mining — Major-General Sir Edward L. Spears ranged widely in his lengthy speech at the annual meeting of the Ashanti Goldfields Corporation, Ghana's major gold producer, extracts from which appear on page 422. As with the other companies in this field Ashanti has now got its Overseas Trade Corporation tax position firmly established. This has already led to a saving of £200,000 which has been put to reserve to strengthen finances against the capital expenditure of over £1,000,000 planned for the next three years—£730,000 of this will be spent in the current period to September 30 next.

General Spears pointed out that there will also be available to meet this expenditure an annual sum of about £275,000 from depreciation and fixed assets replacement reserve. Ashanti thus expects to carry through the programme "without undue encroachment upon future profits available for dividends". Another helpful factor will be a possible £150,000 to £200,000 that may be written back from the 1956 accounts owing to tax provisions no longer required. The chairman was not prepared to make any specific dividend forecasts but the impression remained that there is a chance of the distribution being raised again from last year's 1s. 6d.

Ashanti has no worries as regards the underground position at the mine. The reef is opening up richly at depth as has been revealed month by month in the returns published in London. Technically, there is only one current anxiety. The winder at the new Eaton Turner shaft, a shaft which is designed to play such a large part in the future of the mine, is giving some trouble. General Spears said it was hoped that rectification could be effected without undue difficulty. But if by any chance the winder should have to be replaced then it is possible that the drawing of high-grade ore through this shaft may be delayed beyond the predicted date of August next.

Politically, General Spears, who has been on a prolonged visit to the Coast, recently, views the future of Ghana under Dr. Nkrumah's government with quite a degree of confidence. He made a strong appeal for lower taxes. It was not reasonable, he said, that 53½ per cent of

## LONDON MARKET HIGHLIGHTS

Brokers and jobbers returning thankfully last week from the coldest and most wretched English Easter holiday on record were perhaps cheered a little by the warmth that emanated from the Gold share market.

There was no general upsurge in prices or activity but the undertone of the market was genuinely firm and such buying as there was looked to be solidly based. The imminence of the third post-war South African general election—polling takes place on April 16—had none of the adverse effects on the market that had been gloomily forecast earlier. It probably tended to subdue activity, but since prices quietly edged higher, the feeling grew that once the elections were out of the way gold shares may benefit from the uncertainty in other sections of the Stock Exchange and move well ahead after April 16.

Meanwhile, the March quarterly reports due to make their appearance in a week or so, continued to fire the imagination of some operators. St. Helena remained the outstanding hope on development results and the price at one time notched up 2s. more to an 8-year peak of 42s. 4½d. Harmony, too, were in demand for similar reasons and the finance houses responsible for these mines, Union Corporation and Central Mining, improved to 39s. 9d. and 58s., respectively.

Newer mines often continued to reflect the previous week's news of record March profit figures, while the older dividend payers were inclined to move a few pence higher where changed. Winkelhaak (17s. 3d.) were unaffected by the new financing arrangements that have

been announced in their quarterly report.

General Mining provided another firm spot with a rise of 1s. 6d. to 58s.; strong hopes were expressed that rising income would enable the company to at least restore its dividend to the 25 per cent rate that was paid for many years prior to the reduction in 1956.

A less happy state of affairs existed in the Diamond section. The sharp fall in last quarter's diamond sales figures was not really unexpected, but taken against a background of persistent dullness on Wall Street coupled with declining U.S. industrial activity, the news was a bitter pill to swallow. De Beers (89s. 4½d.) and Anglo Trusts (152s. 6d.) soon fell 2s. or so and Casts came back 6d. to 12s.

Base-metal shares were uniformly dull in the earlier part of the week and share prices wilted in sympathy with the metal quotation. At one time Bancroft were 1s. 6d. down at 14s. 6d., Nchanga 6s. 3d. lower at 186s. 3d. and Rhoanglo 2s. 6d. off at 59s. 4½d. Prices quickly rallied later, however, when Wall Street brightened and a modest demand found the market very short of stock. Chartered remained a pillar of strength throughout on solid investment buying encouraged mainly by their likely O.T.C. benefits: the shares rose 2s. 3d. to 60s.

The tin share market, after wallowing in the doldrums, seemed to heave a sigh of relief when the prices of both cash and forward tin at last moved comfortably above the buffer stock support level again. Among several rises of a few pence, Southern Kinta put on 7½d. to 16s. 9d.

Ashanti's profit should go in Ghana tax. General Spears gave some interesting figures which showed that in the twelve years since the war out of £26,178,516 that the company had obtained from its gold sales no less than £17,000,000 has remained in one form or other in Ghana thus creating wealth where none was before.

#### GOLD PRICE PLEA

General Spears reserved for the meeting of Bibiani, Ashanti's sister company, a reasoned plea for American action on the price of gold. To raise the dollar price would restore international liquidity, put an end to the recurring exchange crises that bedevil international trade and stabilize prices by relating them once more to a realistic standard.

Why this plea was so necessary was apparent when the chairman came to deal with Bibiani's underground position.

The mine is over 40 miles from Ashanti and does not share in its richness at depth. General Spears was quite frank. Tonnage at present in sight should enable the present milling rate (35,000 tons a month) to be maintained until 1962. Thereafter, the life of the property will depend on the discovery of a new major orebody. If this has not been found by next year then "a gradual reduction in output will eventually be unavoidable".

It looks as though the chances of a Bibiani renaissance are now becoming slender. The 4s. shares at 2s. yield 20 per cent on the 10 per cent dividend paid for 1956-57. A substantial part of distributions received should now be regarded as capital amortization in case

the life may, in fact, not be a great deal over five years. The shares could have some small boost if the Ghana Government does decide to continue its aid for mines of this calibre on subsidy lines. And, of course, any higher gold price could make quite a difference.

Extracts from General Spears' speech to Bibiani shareholders appear on page 422.

#### FALCON'S PROFITS TO DATE

At the Falcon Mines' meeting the chairman, Mr. F. L. Wigley, brought shareholders up-to-date with operations so far for the current financial year to September 30 next. The working profits of the company's three Rhodesian gold mines for the five months to the end of February totalled £49,107 excluding additional revenue which will accrue from the sales of gold at prices in excess of 245s. 6d. per oz. for January and February. The comparative figure for the first five months of 1956-57 appears to have been £50,295. In other words, earnings are little changed from those of last year when dividends amounted to 17½ per cent for the third successive occasion. The interim for 1957-58, payable on May 9, has been maintained at 7½ per cent.

It was announced this week, subsequent to the meeting, that the group working profit for March came to £10,597. As pointed out here on March 14, the Dalny mine now provides almost all the Falcon revenue. Last month the milling rate at this mine at 19,600 tons approached for the first time the expanded plant capacity of 20,000 tons. In the year to last September the average monthly crushing was only 15,900 tons.

Extracts from Mr. Wigley's statement appear on page 423.

#### ANOTHER GOLD PRICE PLEA

Anglo-French Exploration has more than half its investment portfolio in gold mining. So, at the meeting the chairman, Mr. F. R. Cottell, added his voice to that of General Spears in making out a case for a higher gold price. In particular, he recalled that major document of a few years ago prepared by the United Nations and entitled, "Measures for International Economic Stability". This put a uniform increase in the gold price in terms of all currencies in the forefront of the remedies, but discarded it owing to the political problems involved.

Mr. Cottell said that "it will be a matter for serious regret if the International Monetary Fund and the United States authorities, in whose hands the decision in practice rests, delay still further to face up to this world-wide problem unless and until a major recession in international trade occurs. . . . I would suggest that some of the crises from which the United Kingdom, in particular, has suffered ever since the last World War would at least have been mitigated if this overdue reform had been adopted".

Other extracts from Mr. Cottell's statement appear on page 423.

**A 2s. Return by Nigel G.M.**—At the annual meeting of the Nigel Gold Mining Co. on May 9, a return of capital of 2s. per share will be proposed. If approved, Nigel's issued capital will be £215,890 in 3s. shares, against the present £359,817 in 5s. units.



## For Gruelling Service

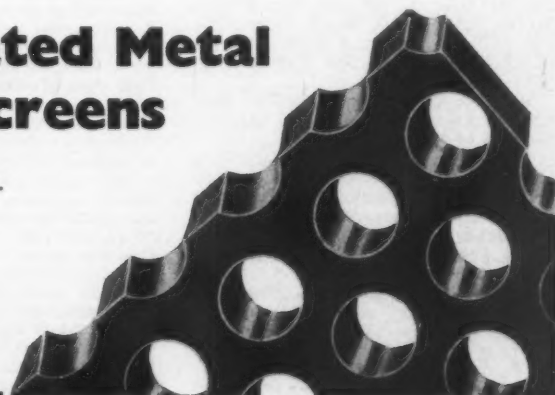
For over seventy years, Harveys have been making Perforated Metal and Wirework for every conceivable purpose, in every kind of metal. 'Harco' Screens are designed to give maximum output over prolonged periods and under the most exacting conditions.

### 'Harco' Perforated Metal & Wirework Screens

Send for Catalogues Nos. MJ 858 and 926.

**Harvey**

G. A. HARVEY & Co. (LONDON) LTD.,  
Woolwich Road, London, S.E.7.  
Telephone: GREenwich 3232 (22 lines)



## ASHANTI GOLDFIELDS CORPORATION

### RECORD TONNAGE AND OUTPUT IN JUBILEE YEAR

The Sixty-first Annual General Meeting of Ashanti Goldfields Corporation Limited was held on April 2 in London.

**Major-General Sir Edward L. Spears, Bart., K.B.E., C.B., M.C., F.Inst.D.**, chairman and managing director, presided and, in the course of his speech, said:

The Corporation has celebrated its jubilee by achieving the largest tonnage and the highest gold output in the 60 years of its history.

This result is due to the programme of development, shaft sinking, and modernization planned and carried out in the face of difficulties of all kinds since the war ended.

It has been achieved, at a cost of £3,329,096, entirely from the Corporation's own resources, without calling on the Shareholders or the public for a penny of fresh capital.

Development and exploitation of the mine will require further large capital sums; but these also we expect to provide out of earnings. We are confident that this expenditure will be justified by the results we hope to achieve.

We have no reason to doubt that we shall be able to keep up the present high level of output. Recent development results, especially in the deeper levels, are very encouraging.

#### Accounts

The principal change in the accounts in the year under review is the increase in the issued capital to £1,872,836 following the issue of fully paid-up bonus shares in September, 1957. One new share of 4s. was issued for every two shares held.

To provide for this, £624,279 was transferred from share premium account, leaving a balance of £53,187. This account represents capital provided by shareholders, and it is logical for the greater part of it to be in the form of issued capital.

At the same time as the bonus issue was made, the issued capital, which was in stock transferable in 4s. units, was reconverted to fully paid unnumbered 4s. shares for reasons of administrative convenience.

Our liquid position has greatly improved.

We spent £312,000 on new plant, machinery, and shafts.

**Profit and Loss Account.**—The profit before tax was £1,349,657, an increase of £707,305 over the previous year. Income tax on these profits, mainly Ghana tax, was £576,126, leaving a profit after tax of £773,531. This is the highest profit since 1940.

We have again taken £50,000 to fixed assets replacement reserve, and have put £200,000 to general reserve.

The reserve for prospecting, £42,000, is required for prospecting the concession and other areas during the next two years.

**Dividend.**—An interim dividend of 1s. per 4s. unit was paid in August, 1957, on the old capital.

At the extraordinary general meeting in September last, which approved the increase in the Corporation's capital and the issue of bonus shares, I stated that we expected to recommend a final dividend of not less than 8d. per share. We

are, in fact, recommending a final dividend of 10d.

The £200,000 placed to general reserve is the saving we have realized because of the Corporation's status as an overseas trading corporation.

It will strengthen our liquid resources, which is necessary in view of the heavy capital commitments to which I shall refer later; but as we shall also have available to meet these approximately £275,000 per annum from depreciation and fixed assets replacement reserve, we expect to be able to carry through this programme without undue encroachment upon future profits available for dividends.

**Production.**—Production in the year under review was 338,727 tons milled, yielding 275,217 oz. of gold.

As I have already stated, both these figures are the highest in the history of the mine.

It is our policy to maintain the high level of output achieved last year.

**Capital Expenditure.**—Capital expenditure over the next three years will amount to not less than £1,016,000. Of this amount £730,000 will be spent during the current year.

Some of the major items are as follows:

- Extensions to the power station, which is at present operating to capacity.
- Treatment plant extension. This will be completed this year.
- Deepening the central ventilation shaft to 26 Level.
- Completion of the equipping of Eaton-Turner Shaft and the provision of the requisite office and change house facilities.

#### Taxation

In general, I feel very strongly that Ghana taxation on our property is far too high.

The Government of Ghana, which is so realistic in its outlook, might well ponder the fact that it is not the natural resources of the world that are in short supply, but rather the capital to exploit them.

There is a great choice for capital investment in the world, and capital will flow where security is assured to it, where taxes are low, labour conditions stable, and prospects of earning reasonable profits favourable.

The Ghana Government is making every effort to ensure stable conditions, labour seems to be sufficient, and more reasonable than it has been in the recent past. Remains Taxation.

In view of the enormous sums we have to find for development and capital expenditure, without which the Mine would have only a short life, we should receive a more adequate reward.

The Ghana Government is anxious to attract capital to the country. The most important step that could be taken would be to lower the rate of tax, in particular company income tax, paid by those like ourselves who have already invested large sums in developing Ghana's resources. At present, the rate of Ghana company income tax is higher than the U.K. rate. It should certainly be lower if Ghana is to attract outside capital.

The report and accounts were adopted.

## BIBIANI (1927) LIMITED

### RECORD TONNAGE MILLED

The thirty-first annual general meeting of Bibiani (1927) Limited was held on April 2 in London.

**Major-General Sir Edward L. Spears, Bart., K.B.E., C.B., M.C., F.Inst.D.** (Chairman and Managing Director), presided and, in the course of his speech, said:

Bibiani will qualify as an Overseas Trade Corporation from April 6, 1957, and this will mean a saving in tax of some £15,000.

Tonnage milled, 371,843, is a record for the Mine, and gold recovery, 77,992 oz., is the highest since the end of the war. Bullion sales produced £983,734.

Mining costs, after deducting the Government Grant of £29,555, were £639,210. Profit after tax of £40,400 was £64,339. The interim dividend of 2.4d. per unit of stock, together with the final dividend of the same amount, which we now recommend, require £28,750.

The Company's liquid position is satisfactory. Net current assets have increased from £431,433 to £537,737.

Output for the current year was planned to be 33,500 tons milled to yield 6,900 oz. of gold. It was, however, recently decided to increase the milling rate to 35,000 tons a month, because the tonnage from the South Quarry is only producing comparatively low-grade ore, so that to maintain gold output at 6,900 oz. a month a larger tonnage must be treated. This higher milling rate will be continued for some months until the quarry grade improves, as it is expected to do.

The old workings in the upper levels of the Mine are being opened up, and by 1959 a considerable tonnage of low-grade ore will be available for mining. This tonnage, together with the surface quarries and underground ore reserves, will be sufficient to maintain the present milling rate until 1962.

Thereafter, the future life of the Mine will depend upon the discovery of a new major orebody. So far, although limited quantities of ore of good value have been disclosed, there are no indications that any of the orebodies are re-making in strength. If the position has not improved by 1959, a gradual reduction in output will eventually be unavoidable. We do not, however, feel that any such conclusion is inevitable, and in any case expect to maintain the present level of output and gold recovery for the next three or four years.

#### Gold Price

The position of a low-grade mine like Bibiani underlines the absurdity of the present low price of gold in relation to the increased cost of everything, labour, machinery and stores, which is necessary to produce it.

It, and the other low-grade mines in Ghana, are an important factor in the country's economy, give employment to thousands of Africans, and make a useful contribution to the reserves of the Commonwealth. Yet they are operating on so small a margin that they can only with difficulty remunerate on a modest scale the capital invested in them.

The only real solution, the only one that would benefit not only the low-grade mines in Ghana but the whole world, would be to raise the price of gold to make it what it should be, a true measure of value.

The report and accounts were adopted.

## ANGLO-FRENCH EXPLORATION

The Sixty-eighth Annual General Meeting of the Anglo-French Exploration Company, Ltd., was held on April 3 in London. The Chairman, **Mr. F. R. Cottell, A.C.A.**, in the course of his speech, said:

Our investments stand in the books at £1,120,949 and are valued at £1,426,127, an excess of £305,178, which, in view of the fall in Stock Exchange prices may be considered as not unsatisfactory.

The main changes in our portfolio of holdings have been in the base metal group, where we have reduced the size of our investments, which at the same time yielded us a useful profit on sale.

The gold mining companies in the Far West Rand and in the Orange Free State of the Union of South Africa, which constitute the major part of our investment in gold mining, continue to progress well.

Satisfactory results were achieved by the oil companies in which we are interested, but the outlook for the current year is not as favourable in view of the recession in oil prices which has taken place in the last few months and the slackening of oil consumption in the United States. Base metals and platinum are also under a cloud, and it may be some time before a substantial improvement can be expected in the affairs of companies.

After making provision for the dividend, current liabilities exceed current assets by £29,878. The profit and loss account reflects the continuing rising trend in our receipts from dividends and interest on investments, which, totalling £128,017, must be considered as satisfactory after the large increase of a year earlier. The profit of £32,715 realized by sales of shares and sundry credits, against £25,288 in 1956, brings our total revenue to £160,732, an increase of some £14,000 over the previous year's revenue. Our expenses have been held at approximately last year's figure, but taxation at £79,571 absorbs a higher proportion of our income. We have applied £10,307 in reduction of book value of investments, which leaves a profit for the year, after taxation, of £50,014. The dividend which we recommend of 1s. 10½d. per £1 unit of stock will, after deduction of income tax at 8s. 6d. in the £, require £48,516, leaving £8,011 unappropriated profit to be carried forward.

The creation of overseas trade corporations under the provisions of the United Kingdom Finance Act, 1957, places such corporations in a better position to compete with foreign-owned companies. It is to be earnestly hoped that the Government will introduce in the coming Finance Bill legislation, long overdue, to simplify and reform the structure of profits tax.

The circular which accompanied the annual report and accounts informed members that the 100,000 ordinary shares of £1 each, which are at present unissued, are to be offered to members at par in the proportion of one new share for every £9 ordinary stock held at March 21, 1958. As in the case of the offer of 100,000 shares in 1955, which was oversubscribed, no part of the issue is to be underwritten. Unless any unforeseen circumstances arise, it is anticipated that the dividend will be maintained at 1s. 10½d. per £1 stock unit on the capital as increased by the issue, the whole of which will rank for the dividend in respect of the year ending December 31, 1958.

## FALCON MINES

The Forty-eighth Annual General Meeting of Falcon Mines, Limited, was held on March 31 at Bulawayo.

**Mr. F. L. Wigley**, Chairman, presiding, said:

The Directors' Report and Accounts, together with my Review of the Company's activities, which have been in your hands for some time, give full details of the operations of your Company for the year ended September 30, 1957, and I now propose to give you a brief account of the work done and the results obtained since the close of the financial year.

The tonnage milled at the Dalny Mine for the five months ended February 28, 1958, was 85,300 tons, which yielded 15,506 oz. fine of gold, equal to a recovery of 3.63 dwt. per ton milled. The working profit at the mine for that period, based on a selling price of gold of 245s. 6d. per oz., was £41,990. In addition, £1,265 accrued from sales of gold at prices above 245s. 6d. per oz. in respect of gold produced during three

months ended December 31, 1957.

Regarding development, the total footage advanced was 3,206, of which 1,255 ft. were sampled and 545 ft., equal to 43 per cent, were payable, averaging 6.2 dwt. per ton over a width of 68 in.

At the Sunace and Bay Horse Mines, the estimated working profits for the five months were £4,861 and £991 respectively.

The working profit for the three mines for the period was thus £49,107, excluding additional revenue which will accrue from the sales of gold at prices in excess of 245s. 6d. per oz. for the months of January and February, 1958.

On March 10, Dividend No. 9 of 4½d. per share, equivalent to 7½ per cent, was declared payable to Shareholders registered on March 31, 1958. This is the same as declared in March, 1957. Dividend warrants will be posted on or about May 9, 1958.

The Report and Accounts were adopted.

## Publications Received

Mining progress in British Guiana is reviewed in the report on the Geological Survey Department for the year 1956. Available from the Department, Georgetown, Demerara, price 50 cents (2s. 1d.).

A report on the market in India for surveying instruments has been prepared by the U.K. Trade Commissioner Service in India for the Export Services Branch, Board of Trade, Lacon House, Theobalds Road, London, W.C.1. Ref. ESB 19217/57.

The work of the Geological Survey Department, Federation of Nigeria, is reviewed in the Department's annual report covering the year 1956-57. During this period the geology of the Enugu coalfield was virtually completed. Available from the Federal Government Printer, Lagos, 9d. net.

All aspects of the titanium industry, including the mineralogy and geology of deposits throughout the world, are summarized in *Titanium, a Materials Survey*, by Jesse A. Miller, Bureau of Mines Information Circular 7791. The publication is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. Price \$1.

The London School of Hygiene and Tropical Medicine has published a report by the Ross Institute Industrial Advisory Committee of a meeting on October 3, 1957, when an address entitled "Housing for Estate Labour" was given by Dr. O. J. S. Macdonald (Medical Officer of the Ceylon Planters' Association Estates' Health Scheme).

A detailed study of the production, trade and developments of the titanium industry in 1956, with particular emphasis on the North American industry, has been published by the Mineral Resources Division, Department of Mines and Technical Surveys, Ottawa, as Mineral Resources Information Circular M.R. 26. The author is T. H. Janes. Tables dealing with production, consumption and trade in titanium ores, metal and alloys, manufactured TiO<sub>2</sub>, and fabricated products are included. Processing techniques from

the ore to the metal, and pigment, are outlined.

*Asian Annual*, 1957, provides interesting facts and figures relating to the countries of Asia. Climatic conditions, industrial statistics, population and similar details are all linked by terse and informative notes. The annual is published by *Eastern World* at 15s. It comprises 134 pages with advertisements.

A new safety publication by the Bureau of Mines, U.S. Department of the Interior, is designed as part of a Federal accident-prevention campaign to reduce injuries from falls of rocks. It covers an exceptionally wide range of mining methods, is adequately illustrated, and is readily adaptable to non-metallic or metallic operations. A copy of the publication, *Miners' Circular 52—Accidents from Falls of Rock or Ore at Metal and Non-Metallic Mines*, can be purchased for 40 cents from the Superintendent of Documents, Washington 25, D.C.

The latest edition of the BEAMA Catalogue gives details of more than 1,300 product groups in 962 pages, contains a very comprehensive trade directory and buyers' guide, and included a glossary in five languages.

The Statistical Summary of the Mineral Industry, price £1 7s. 6d. net (by post £1 8s. 4d.), is an annual volume of statistical tables which contains comprehensive details of world production, exports and imports of all important commercial minerals and metals. The new edition under notice covers the important six-year period 1951 to 1956.

Production tables for copper, lead, tin and zinc show not only the output of the relevant ores in terms of metal, but also give the figures of smelter production. In the case of aluminium, figures for bauxite and natural cryolite are also shown. The section on coal deals with coke, briquettes and the chief coal by-products; moreover, as the same unit of weight is used in the section on petroleum—which includes other natural products as well as the chief refinery products—comparison of the output and trade of these two principal fuels is facilitated. Full avail-

able statistics are given for the minor metals which are becoming of increasing importance in modern industry. Figures are given, for example, for lithium, columbium, tantalum and titanium.

★

Altimeters, commonly used for determining elevations, can be employed as valuable tools in checking the efficiency of mine ventilation systems. As part of its continuing studies in the complex problem of providing sufficient air underground to dilute and remove harmful gases, and thus safeguard the lives of workers, the United States Bureau of Mines has tested altimeters in the ventilation systems of several coal mines. It was found that the sensitivity of instruments to changes in air pressures can be translated to reveal losses in ventilating efficiency such as caused by narrow passages, leaks, short-circuits, roof-falls, and other conditions. In a report on the Bureau's findings, it is emphasized that the reliability of the altimeters depends both on their proper use and on the correct interpretation of data obtained from them and associated instruments. A copy of the publication, IC7809, *Making Ventilation-Pressure Surveys with Altimeters*, can be obtained from the Publications Distribution Section, United States Bureau of Mines, 4800 Forbes Street, Pittsburgh, United States.

#### THE UNIVERSITY OF SHEFFIELD

##### POST-GRADUATE SCHOOL IN MINING

Facilities are available for graduates in science or engineering and similarly qualified persons to undertake research into scientific problems related to mining.

A special one year course of instruction leading to a Post-graduate Diploma in Mining will begin in October, 1958. Entry to this is not confined to graduates.

Full particulars from The Director, Post-graduate School in Mining, University of Sheffield, St. George's Square, Sheffield, 1.

APPLICATIONS are invited for the position of MINING ENGINEER on a large Gold Mine in Ghana. Status and prospects are equivalent to those of Underground Manager. Duties involve the co-ordination of the Geological, Survey, Planning, Labour Control, and Grade Control Departments. Applicants should be Graduates of a recognized University or hold equivalent qualifications, and should have had several years' experience in Senior Executive Appointments. Salary £2,000-£2,500 per annum in accordance with experience and qualifications. Continuous contract with tours abroad of 12 months. Three months' leave on full pay on completion of each tour. Passages and furnished accommodation with lighting and medical attention are free. Staff Assurance Scheme in operation. Write stating age and experience to Box 620, *The Mining Journal Ltd.*, 15 Wilson Street, Moorgate, London, E.C.2.

### Rand & Orange Free State Returns for March

Company	March 1958			Year ends	Current Financial Year Total to date			Last Financial Year Total to date		
	Tons (000)	Yield (oz)	Profit (£000)		Tons (000)	Yield (oz)	Profit (£000)	Tons (000)	Yield (oz)	Profit (£000)
<b>Goldfields</b>										
Doornfontein	86	35,841	185.4	J	769	317,725	1760.5	685	273,930	1305.4
Libanon	100	22,926	54.3	J	1,008	206,528	480.0	876	196,536	493.3
Luipaards Vlei	70	12,624	5.0	J	643	115,121	64.7	732	131,169	93.7
Rietfontein	22	5,021	13.3	D	67	15,379	42.5	75	17,049	48.1
Robinson	71	15,194	5.1	D	214	45,534	17.7	218	43,725	17.6
Simmer & Jack	80	15,995	12.4	D	249	49,273	42.3	283	51,997	52.0
Sub Nigel	66	16,462	25.3	J	592	149,567	247.7	594	166,577	415.4
Venterspost	122	28,994	54.9	J	1,085	262,241	495.9	1,112	254,438	591.0
Vlakfontein	50	17,461	84.3	D	146	51,479	247.9	144	51,768	250.5
Vogels	96	21,589	43.9	D	288	65,314	137.7	298	69,485	184.7
West Drie	77	73,780	598.9	J	677	649,744	5403.7	675	633,495	5210.5
<b>Anglo American</b>										
Brakpan	124	16,415	12.7	D	359	49,898	31.8	317	54,129	34.0
Daggas	226	47,462	244.8	D	652	137,667	708.0	653	145,208	789.8
East Daggas	91	15,123	28.5	D	265	44,129	78.3	280	46,195	96.0
F S Geduld	66	47,360	330.3	S	382	273,267	1885.6	288	144,570	691.1
Lorraine	67	12,179	L23.0	S	376	71,608	L103.1	367	70,296	L41.8
President Brand	80	58,618	475.7	S	434	324,763	2611.6	362	278,123	2289.5
President Steyn	94	36,083	193.4	S	554	246,119	1236.1	532	206,792	1195.4
S A. Lands	89	18,101	51.0	D	256	52,725	147.3	258	56,795	195.4
Springs	127	14,100	8.9	D	372	41,469	23.2	372	41,625	18.0
Vaal Reefs	69	31,050	177.4	D	200	89,767	512.0	167	72,235	419.5
Welkom	85	24,888	70.4	S	488	144,355	391.1	514	128,452	278.9
Western Holdings	96	52,274	386.3	S	574	301,131	2918.2	536	244,542	1564.7
West Reef Ex.	112	26,213	60.3	D	327	76,206	168.0	362	77,900	184.1
<b>Central Mining</b>										
Blyvoor	107	61,870	431.2	J	926	545,961	3863.6	946	534,060	3888.9
City Deep	146	27,957	8.5	D	431	82,117	27.7	448	87,768	55.8
Cons. M.R.	142	21,805	12.5	J	1,436	201,462	91.1	1,477	206,397	80.4
Crown	236	35,573	15.7	D	676	103,800	48.0	731	105,971	L20.4
D. Roodepoort	181	32,727	51.3	D	531	95,729	149.2	547	95,793	157.8
East Rand Prop.	223	57,586	154.3	D	650	167,119	439.5	632	163,694	267.8
Harmony	78	31,870	147.9	J	722	560,366	1420.3	701	243,966	1414.5
Modder East	137	13,184	1.5	J	1,224	122,965	23.0	1,248	128,407	16.0
Rose Deep	60	8,148	5.5	D	169	23,438	13.7	146	22,592	0.6
<b>J.C.I.*</b>										
E. Champ d'Or	12	294	L25.6	D	36	883	L78.4	35	961	L74.2
Freddies Cons.	47	15,805	L21.5	D	139	46,999	L58.4	165	40,565	L80.5
Govt. G.M.A.	62	10,549	1.4	D	187	32,668	3.9	428	64,969	L70.1
Randfontein	30	5,537	5.1	D	80	13,803	15.2	—	—	—
<b>Union</b>										
East Geduld	126	38,745	264.0	D	368	113,162	763.2	408	125,656	877.7
Geduld Prop.	80	12,596	10.0	D	243	38,360	30.3	309	48,988	79.2
Grootvlei	195	41,544	211.9	D	570	121,514	617.8	572	122,542	641.7
Marievale	72	18,900	83.5	D	211	55,438	244.1	211	55,490	248.0
St. Helena	113	33,399	178.9	D	339	100,339	438.9	350	102,042	560.6
Van Dyk	76	13,700	25.7	D	224	39,872	64.0	233	38,395	8.9
<b>General Mining</b>										
Buffelsfontein	109	36,123	177.0	J	985	322,679	1694.3	261	73,205	247.3
Ellaton	32	7,520	32.8	D	94	21,645	98.8	96	20,279	47.3
S. Roodepoort	29	6,926	24.8	J	264	62,208	225.8	260	60,726	211.4
Stilfontein	110	54,543	379.5	D	325	161,330	925.9	280	118,994	736.7
W. Rand Cons.	136	19,338	12.7	D	461	51,096	29.6	—	—	—
<b>Anglo-Transvaal</b>										
Hartebeestfontein	83	45,235	298.5	J	762	417,850	2811.1	760	334,853	2041.5
N. Klerksdorp	11	1,258	L6.1	D	31	3,171	L22.5	31	3,719	L15.4
Rand Leases	158	23,858	2.2	J	1,518	230,364	66.8	1,420	220,992	L169.0
Village M.R.	27	4,692	2.0	J	285	46,777	42.4	297	47,337	75.3
Virginia, O.F.S.	92	24,406	23.9	J	900	222,074	509.1	829	187,615	533.1
<b>Others</b>										
N. Kleinfontein	96	11,426	0.5	D	276	33,611	1.5	291	33,473	L31.7
Wit Nigel	18	4,346	6.6	J	160	38,447	45.3	162	31,886	70.2

Gold has been valued at 248s. 9d. (February 248s. 4d.) per oz. fine. L indicates loss. † Working Profit. \* Working Profit includes sundry revenue. Table excludes profits from Uranium, Pyrite and Acid, and also production from Uranium divisions at Luipaards Vlei, Randfontein and W. Rand Consolidated.

**BRITISH COMPANY** operating metalliferous mine overseas has vacancies for mining engineers as under:

- An engineer, aged 35-45 years, with sufficient experience, both technical and administrative, to qualify for a responsible appointment; commencing remuneration not less than £2,500 per annum.
- A young engineer with at least three years' underground mining experience; commencing remuneration not less than £1,200 per annum.

Portuguese- or Spanish-speaking applicants preferred.

Good living conditions with free housing provided for single men or families. Applications giving age, qualifications, and full details of experience to Box 599, Walter Skinner Ltd., 20 Copthall Avenue, London, E.C.2.

#### THE WORLD'S GREATEST BOOKSHOP

**FOYLES**  
... FOR BOOKS ...

#### FOR ALL YOUR Technical Books

Foyles is an experience—the largest bookstore on earth. If you're a lover of books, large or small, modern or rare, here's Paradise.

—Fielding's Guide to Europe

119-125 CHARING CROSS ROAD  
LONDON, WC2

Gerrard 5660 (20 lines) ★ Open 9-6 (incl. Sats).  
Two mins. from Tottenham Court Rd. Sta.

# *PROTECT Plant & Crushing Equipment*



## *Detects*

- MANGANESE DIGGER TEETH
- HAMMER HEADS
- NUTS—BOLTS
- ALL TRAMP METALS  
(FERROUS & NON-FERROUS)

# **HEAVY DUTY DETECTOR**



METAL DETECTION LTD • MOSELEY STREET • BIRMINGHAM

TELEPHONE: VIC. 0211

TELEGRAMS: METECTION, BIRMINGHAM

able statistics are given for the minor metals which are becoming of increasing importance in modern industry. Figures are given, for example, for lithium, columbium, tantalum and titanium.

★

Altimeters, commonly used for determining elevations, can be employed as valuable tools in checking the efficiency of mine ventilation systems. As part of its continuing studies in the complex problem of providing sufficient air underground to dilute and remove harmful gases, and thus safeguard the lives of workers, the United States Bureau of Mines has tested altimeters in the ventilation systems of several coal mines. It was found that the sensitivity of instruments to changes in air pressures can be translated to reveal losses in ventilating efficiency such as caused by narrow passages, leaks, short-circuits, roof-falls, and other conditions. In a report on the Bureau's findings, it is emphasized that the reliability of the altimeters depends both on their proper use and on the correct interpretation of data obtained from them and associated instruments. A copy of the publication, IC7809, *Making Ventilation-Pressure Surveys with Altimeters*, can be obtained from the Publications Distribution Section, United States Bureau of Mines, 4800 Forbes Street, Pittsburgh, United States.

#### THE UNIVERSITY OF SHEFFIELD

##### POST-GRADUATE SCHOOL IN MINING

Facilities are available for graduates in science or engineering and similarly qualified persons to undertake research into scientific problems related to mining.

A special one year course of instruction leading to a Post-graduate Diploma in Mining will begin in October, 1958. Entry to this is not confined to graduates.

Full particulars from The Director, Post-graduate School in Mining, University of Sheffield, St. George's Square, Sheffield, 1.

APPLICATIONS are invited for the position of MINING ENGINEER on a large Gold Mine in Ghana. Status and prospects are equivalent to those of Underground Manager. Duties involve the co-ordination of the Geological, Survey, Planning, Labour Control, and Grade Control Departments. Applicants should be Graduates of a recognized University or hold equivalent qualifications, and should have had several years' experience in Senior Executive Appointments. Salary £2,000-£2,500 per annum in accordance with experience and qualifications. Continuous contract with tours abroad of 12 months. Three months' leave on full pay on completion of each tour. Passages and furnished accommodation with lighting and medical attention are free. Staff Assurance Scheme in operation. Write stating age and experience to Box 620, The Mining Journal Ltd., 15 Wilson Street, Moorgate, London, E.C.2.

### Rand & Orange Free State Returns for March

Company	March 1958			Year ends	Current Financial Year Total to date			Last Financial Year Total to date		
	Tons (000)	Yield (oz)	Profit (£000)		Tons (000)	Yield (oz)	Profit (£000)	Tons (000)	Yield (oz)	Profit (£000)
<b>Goldfields</b>										
Doornfontein	86	35,841	185.4	J	769	317,725	1760.5	685	273,930	1305.4
Libanon	100	22,926	54.3	J	1,008	206,528	480.0	876	196,536	493.3
Luipaards Vlei	70	12,624	5.0	J	643	115,121	64.7	732	131,169	93.7
Rietfontein	22	5,021	13.3	D	67	15,379	42.5	75	17,049	48.1
Robinson	71	15,194	5.1	D	214	45,534	17.7	218	43,725	17.6
Simmer & Jack	80	15,995	12.4	D	249	49,273	42.3	283	51,997	52.0
Sub Nigel	66	16,462	25.3	J	592	149,567	247.7	594	166,577	415.4
Venterspost	122	28,994	54.9	J	1,085	262,241	495.9	1,112	254,438	591.0
Vlakfontein	50	17,461	84.3	D	146	51,479	247.9	144	51,768	250.5
Vogels	96	21,589	43.9	D	288	65,314	137.7	298	69,485	156.7
West Drie	77	73,780	598.9	J	677	649,744	5403.7	675	633,495	5210.5
<b>Anglo American</b>										
Brakpan	124	16,415	12.7	D	359	49,898	31.8	317	54,129	34.0
Daggas	226	47,462	244.8	D	652	137,667	708.0	653	145,208	789.8
East Daggas	91	15,123	28.5	D	265	44,129	78.3	280	46,195	96.0
F S Geduld	66	47,360	330.3	S	382	273,267	1885.6	288	144,570	691.1
Lorraine	67	12,179	123.0	S	376	71,608	1103.1	367	70,296	141.8
President Brand	80	58,618	475.7	S	434	324,763	2611.6	362	278,123	2289.5
President Steyn	94	36,083	193.4	S	554	246,119	1236.1	532	206,792	1195.4
S A. Lands	89	18,101	51.0	D	256	52,725	147.3	258	56,795	195.4
Springs	127	14,100	8.9	D	372	41,469	23.2	372	41,625	18.0
Vaal Reef	69	31,050	177.4	D	200	89,767	512.0	167	72,235	419.5
Welkom	85	24,888	70.4	S	488	144,355	391.1	514	128,452	278.9
Western Holdings	96	52,274	386.3	S	574	301,131	2918.2	536	244,542	1564.7
West Reef Ex.	112	26,213	60.3	D	327	76,206	168.0	362	77,900	184.1
<b>Central Mining</b>										
Blyvoor	107	61,870	431.2	J	926	545,961	3863.6	946	534,060	3888.9
Clay Deep	146	27,957	8.5	D	431	82,117	27.7	448	87,760	55.8
Cons. M.R.	142	21,805	12.5	J	1,436	201,462	91.1	1,477	206,397	80.4
Crown	236	35,573	15.7	D	676	103,800	48.0	731	105,971	120.4
D. Roodepoort	181	32,727	51.3	D	531	95,729	149.2	547	95,793	157.8
East Rand Prop.	223	57,586	154.3	D	650	167,119	439.5	622	163,694	267.8
Harmony	78	31,870	147.9	J	722	560,366	1420.3	701	243,966	1414.5
Modder East	137	13,184	1.5	J	1,224	122,965	23.0	1,248	128,407	16.0
Rose Deep	60	8,148	5.5	D	169	23,438	13.7	146	22,592	0.6
<b>J.C.I.*</b>										
E. Champ d'Or	12	294	L25.6	D	36	883	L78.4	35	961	L74.2
Freddies Cons.	47	15,805	L21.5	D	139	46,999	L58.4	165	40,565	L80.5
Govt. G.M.A.	62	10,549	1.4	D	187	32,668	3.9	428	64,969	L70.1
Randfontein	30	5,537	5.1	D	80	13,803	15.2	—	—	—
<b>Union</b>										
East Geduld	126	38,745	264.0	D	368	113,162	763.2	408	125,656	877.7
Geduld Prop.	80	12,596	10.0	D	243	38,360	30.3	309	48,988	79.2
Grootvlei	195	41,544	211.9	D	570	121,514	617.8	572	122,542	641.7
Marievale	72	18,900	83.5	D	211	55,458	244.1	211	55,490	248.0
St. Helena	113	33,399	178.9	D	339	100,339	438.9	350	102,042	560.6
Van Dyk	76	13,700	25.7	D	224	39,872	64.0	233	38,395	8.9
<b>General Mining</b>										
Buffelsfontein	109	36,123	177.0	J	985	322,679	1694.3	261	73,205	247.3
Ellaton	32	7,520	32.8	D	94	21,645	98.8	96	20,279	47.3
S. Roodepoort	29	6,926	24.8	J	264	62,208	225.8	260	60,726	211.4
Stilfontein	110	54,543	379.5	D	325	161,330	925.9	280	118,994	736.7
W. Rand Cons.	136	19,338	12.7	D	461	51,096	29.6	—	—	—
<b>Anglo-Transvaal</b>										
Hartebeestfontein	83	45,235	298.5	J	762	417,850	2811.1	760	334,853	2041.5
N. Klerksdorp	11	1,258	L6.1	D	31	3,171	L22.5	31	3,719	L15.4
Rand Leases	158	23,858	2.2	J	1,518	230,364	66.8	1,420	220,992	L169.0
Village M.R.	27	4,692	2.0	J	285	46,777	42.4	297	47,337	75.3
Virginia, O.F.S.	92	24,406	23.9	J	900	222,074	509.1	829	187,615	533.1
<b>Others</b>										
N. Kleinfontein	96	11,426	0.5	D	276	33,611	1.5	291	33,473	L31.7
Wit Nigel	18	4,346	6.6	D	160	38,447	45.3	162	31,886	70.2

Gold has been valued at 248s. 9d. (February 248s. 4d.) per oz. fine. L indicates loss. † Working Profit. \*Working Profit includes sundry revenue. Table excludes profits from Uranium, Pyrite and Acid, and also production from Uranium divisions at Luipaards Vlei, Randfontein and W. Rand Consolidated.

**BRITISH COMPANY** operating metalliferous mine overseas has vacancies for mining engineers as under:

- An engineer, aged 35-45 years, with sufficient experience, both technical and administrative, to qualify for a responsible appointment; commencing remuneration not less than £2,500 per annum.
- A young engineer with at least three years' underground mining experience; commencing remuneration not less than £1,200 per annum.

Portuguese- or Spanish-speaking applicants preferred.

Good living conditions with free housing provided for single men or families. Applications giving age, qualifications, and full details of experience to Box 599, Walter Skinner Ltd., 20 Copthall Avenue, London, E.C.2.

#### THE WORLD'S GREATEST BOOKSHOP

**FOYLES**  
FOR BOOKS

#### FOR ALL YOUR Technical Books

Foyles is an experience—the largest bookstore on earth. If you're a lover of books, large or small, modern or rare, here's Paradise.

—Fielding's Guide to Europe

119-125 CHARING CROSS ROAD  
LONDON, WC2

Gerrard 5660 (20 lines) ★ Open 9-6 (incl. Sats.)  
Two mins. from Tottenham Court Rd. Sta.

# *PROTECT Plant & Crushing Equipment*



## *Detects*

- MANGANESE DIGGER TEETH
- HAMMER HEADS
- NUTS—BOLTS
- ALL TRAMP METALS  
(FERROUS & NON-FERROUS)

# **HEAVY DUTY DETECTOR**



METAL DETECTION LTD • MOSELEY STREET • BIRMINGHAM

TELEPHONE: VIC. 0211

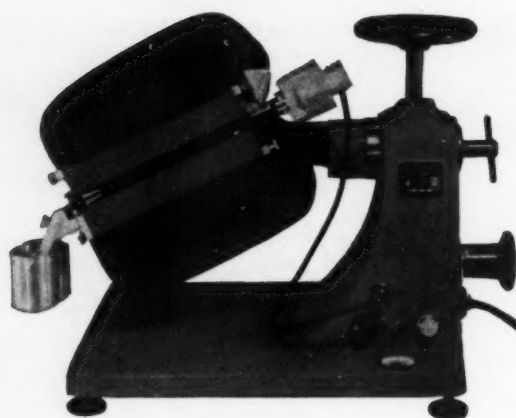
TELEGRAMS: METECTION, BIRMINGHAM

## For the Most Accurate and Delicate Magnetic Separation of Minerals . . .



The high power and close discrimination of the ISODYNAMIC Magnetic Separator are shown by its ability to separate minerals which are only feebly magnetic—even when their susceptibilities are extremely close together.

It is possible to separate diamagnetic substances like zircon or quartz having negative mass susceptibilities of  $-0.3 \times 10^{-6}$  from substances that are less strongly diamagnetic, or are paramagnetic. Get more information on this invaluable tool for the mineral investigator.



**INCLINED FEED**  
Vertical Feed Attachments also available

For more complete information  
write for  
BULLETIN 138-1



**S. G. FRANTZ CO., Inc. . . . Engineers**

P.O. Box 1138  
Trenton 6, New Jersey,  
U.S.A.

Cable Address  
MAGSEP,  
Trentonnewjersey



### A perfect seal in a matter of seconds

For temporary pipe lines 'Unicone' instantaneous joints are recommended. Comprising two parts only, they fasten with a "snap" ensuring a perfect seal in a matter of seconds.

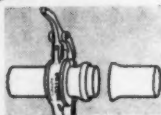
For permanent or semi-permanent pipe lines 'Unicone' bolted-type joints are usually employed and can be assembled far more quickly than any flexible joint giving positive anchorage.

## 'UNICONE'

Flexible Joints for all Pipelines

*Leakproof, safe, reliable*

THE UNICONE CO. LTD., RUTHERGLEN, GLASGOW, SCOTLAND



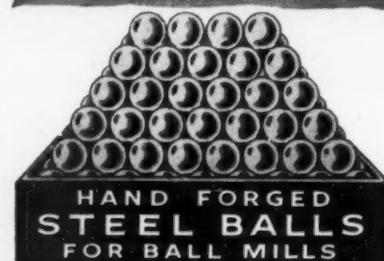
Rubber gasket in position and joint ready to pull over.



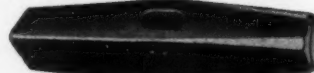
Pipe ends joined ready for locking.



The completed joint.



**THE BEST BREAKING HAMMER EVER MADE**



PLEASE QUOTE M/J/A WITH ORDER

**F. J. BRINDLEY & SONS (SHEFFIELD) LTD.**

CENTRAL HAMMER WORKS SHEFFIELD

Phone and Grams: Sheffield 24201/2

# Metal and Mineral Trades

## A. STRAUSS & CO. LTD.

FOUNDED 1875

PLANTATION HOUSE, MINCING LANE, LONDON, E.C.3

### METALS

Telephone: Mincing Lane 5531 (10 lines)  
Telegrams: Straussar Phone London

Tele: OB LN 28858

### RUBBER

Telephone: Mansion House 9062 (3 lines)  
Telegrams: Ascorub Phone London

**MERCHANTS**

**EXPORTERS**

**IMPORTERS**

Non-Ferrous Metals — Virgin, Alloys, Scrap  
RUBBER COPPER REFINERS

Members of the London Metal Exchange

Dealer Members of the Rubber Trade Association

Members of the National Association of Non-Ferrous Scrap Metal Merchants

## EVERITT & Co. Ltd.

40 CHAPEL STREET  
LIVERPOOL

Tele. Address: Persistent, Liverpool

Phone: 2995 Central

### SPECIALITY:

**MANGANESE PEROXIDE ORES**

We are buyers of:

WOLFRAM, SCHEELITE, VANADIUM,  
MOLYBDENITE, ILMENITE, RUTILE,  
ZIRCONIUM and TANTALITE ORES

Suppliers of:

**FERRO-ALLOYS & METALS, NON-FERROUS ALLOYS**

## BLACKWELLS

Buyers and  
consumers of

## FOR ALLOYS

- COLUMBITE
- TANTALITE
- TUNGSTEN
- MANGANESE

Makers of FERRO ALLOYS, NON-FERROUS ALLOYS  
RARE METALS

**BLACKWELL'S METALLURGICAL WORKS**

THERMETAL HOUSE, GARSTON, LIVERPOOL, 19

Telephone: Garston 980

Telegrams: Blackwell, Liverpool

Telegrams:  
"BASSETT" PHONE, LONDON.

Telephone:  
MANSION HOUSE 4401/3.

## BASSETT SMITH & Co. Ltd.

(Incorporating George Smith & Son)

15/18 LIME ST., LONDON, E.C.3

**METALS,**

**ORES** (Copper, Zinc, Lead, &c., Complex),  
**RESIDUES, SKIMMINGS & ASHES**  
**NON-FERROUS SCRAP**

Telephone:  
MON. 5941-3

Cables:  
AYRTONMET

Telex:  
LONDON 2-2475

## AYRTON METALS LIMITED

(Members of the London Metal Exchange)

IMPERIAL HOUSE, DOMINION STREET, LONDON, E.C.3

IMPORTERS AND EXPORTERS OF

**NON-FERROUS VIRGIN METALS, SCRAP,  
ALLOYS, ORES, MINERALS AND BY-PRODUCTS**

containing

**BASE AND PRECIOUS METALS**

**DEALERS IN PLATINUM GROUP METALS**

ADVANCES MADE AGAINST CONSIGNMENTS

U.S. Agents

The Ayrton Metal & Ore Cpn., 30 Rockefeller Plaza, New York 20, N.Y.

Cable Address: WAHCHANG, NEW YORK

## WAH CHANG CORPORATION

(FORMERLY WAH CHANG TRADING CORPORATION)

233 BROADWAY

NEW YORK 7, NEW YORK

## TUNGSTEN TIN

### BUYERS

Tungsten Concentrates, Tungsten Tin Concentrates  
Mixed Tungsten Ores  
Tungsten Tailings, Scrap, Tips, Grindings  
Tin Concentrates—Tin Dross, Tin Furnace Bottoms

### SELLERS

Tungsten Concentrates to Buyers' Specifications  
Tungsten Salts, Tungsten Powder  
Tungsten Rods and Wires  
Tungsten Ingots, Tin Oxides, Tin Chlorides

PLANT — GLEN COVE, NEW YORK

Telegrams :      Cables :      Telephone :      International Telex  
Nonfermat      Nonfermat      Mansion      London  
Telex, London      London      House 4521      8547

## HENRY GARDNER & CO. LTD.

Non-Ferrous Metals  
and Semi-Manufactures,  
Ores, Minerals and Residues,  
Rubber  
Iron and Steel  
and General Merchandise

2 METAL EXCHANGE BUILDINGS,  
LONDON, E.C.3  
and at BIRMINGHAM, MANCHESTER and GLASGOW

## GEORGE T. HOLLOWAY & CO. LTD.

METALLURGISTS & ASSAYERS,  
ORE TESTING, WORKS AND  
METALLURGICAL RESEARCH LABORATORIES

Atlas Road, Victoria Road, Acton,  
LONDON, N.W.10

Telephone No.:  
ELGAR 5202

Tels. & Cables:  
NEOLITHIC LONDON

MINING &  
CHEMICAL  
PRODUCTS  
LIMITED

86 Strand  
London WC2  
Telephone  
Covent Garden  
3393

Buyers of Ores,  
Concentrates  
and Residues of  
**BISMUTH**  
**INDIUM**  
**SELENIUM**




**WORLD-WIDE  
SERVICE**

**DANIEL C.  
GRIFFITH  
& CO.  
ASSAYERS**  
TO THE BANK OF ENGLAND  
**27/33, PAUL STREET,  
LONDON, E.C.2.**

Branch Office: LEFKA, Cyprus

Also at:  
BRISTOL  
BIRMINGHAM  
GLASGOW  
HULL  
LIVERPOOL  
NEWCASTLE  
S. WALES

Analytical Chemists, Samplers,  
Technical representatives in  
sales of Ores & Metals at all  
Ports and Works.

Analyses of  
**PRECIOUS METALS  
RARE EARTHS  
BASE METALS  
ORES & RESIDUES**  
Etc.

Also in:  
BELGIUM  
CANADA  
FRANCE  
GERMANY  
HOLLAND  
ITALY  
PORTUGAL  
SPAIN  
SWEDEN  
SWITZERLAND  
U.S.A.

Telephone :  
MONARCH 1314 (3 lines)

Telegraphic Address:  
"GRYFFYDD, LONDON."

## J. LOWENSTEIN & CO. LTD.

GREENWICH HOUSE,  
18/13 NEWGATE STREET, LONDON, E.C.1  
Telephone: City 8401 (7 lines)

**ORES - METALS - RESIDUES**

**ROURA & FORGAS, LTD.**

Telephone No:  
GERRARD 9641

*Sole Sterling Area Suppliers of*

## ITALIAN QUICKSILVER

COLQUHOUN HOUSE,  
27/37 BROADWICK STREET, LONDON, W.1

## The Mining Journal ANNUAL REVIEW — 1958 EDITION

Summarizes events and statistics of 1957

**Ready in May — Price 15/-**

Orders may be placed through Newsagents or sent direct to :-

THE PUBLISHER, The Mining Journal,  
15 Wilson Street, Moorgate, London, E.C.2

# THE CHROME COMPANY LTD.

## Rhodesian and Transvaal Chrome Ores

*Metallurgical  
Refractory and  
Chemical Grades*

AVAILABLE FOR PROMPT SHIPMENT

**103 MOUNT STREET • LONDON • W.I.**

Telephone  
**HYDE PARK 9951**

Telegrams  
**ORECOS LONDON**

Telex  
**ORECOS LONDON 2-3290**

### **BARNET METAL CO., LTD.**

Elektron House, Brookhill Road, New Barnet, Herts.  
Phone: Barnet 5187 and 3901

**STOCKISTS OF: Aluminium, Brass and Copper**

**BUYERS OF: all non-ferrous scrap**

*The RIGHT firm to deal with*

### **RHONDDA METAL CO. LTD.**

1 HAY HILL, BERKELEY, SQ., LONDON, S.W.1  
Works: PORTH, GLAM.

**PHOSPHOR COPPER,  
PHOSPHOR BRONZE, LEAD BRONZE,  
GUNMETAL, BRASS**

Telephone: MAYFAIR 4654

Cables RONDAMEY

## **THE STRAITS TRADING COMPANY LIMITED**

P.O. Box 700, OCEAN BUILDING, SINGAPORE

Works: SINGAPORE & PENANG

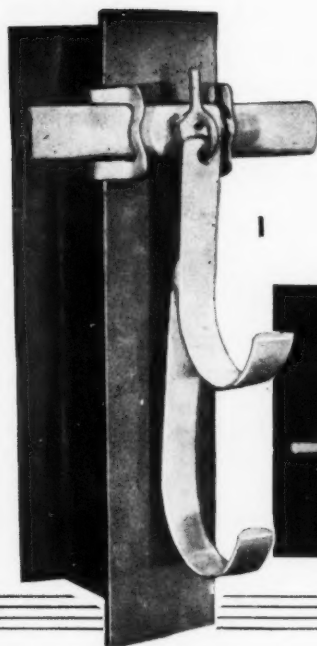
### **STRAITS REFINED TIN**

— "THE STRAITS TRADING CO. LTD." BRAND —

**THE BRITISH TIN SMELTING CO. LTD., LIVERPOOL**

London Agents:

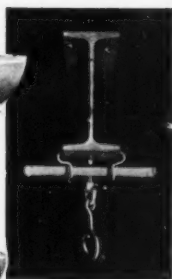
**W. E. MOULSDALE & CO. LTD., 2 Chantrey House, Eccleston Street, S.W.1**



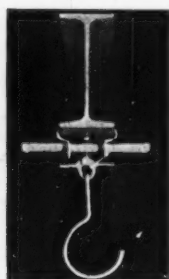
## THE 'HANDY' CLIP

Locks on all flange widths from 1½" to 7½"

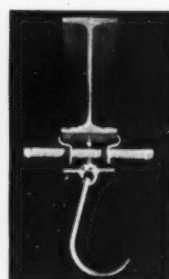
- 1 Double Cable Carrier
- 2 Pig Tail—3/16" diameter wire
- 3 Open Hook—¼" diameter wire
- 4 Single Cable Carrier



2



3



4

## Hudswell, Clarke & Co. Ltd.

Railway Foundry, Leeds 10.

London Office : 120/122 Victoria St., Westminster, S.W.1.

Telephone : 34771 (6 lines)

Telephone : VICToria 6786



## STEEL CAPPELS

Solid forged Guide Rope and  
Winding Rope Cappels.

Only materials conforming to  
the latest British Standard  
specification are used in  
manufacturing these Cappel.

We will gladly furnish  
Fully Approved Inspection,  
Crack Detection, X-ray Reports,  
etc., as requested.

